17.V.2001

MAYURA

Vol. 13 1996

JOURNAL
OF
***BIRDWATCHERS'* SOCIETY**
OF ANDHRA PRADESH

BIRDWATCHERS' SOCIETY OF ANDHRA PRADESH

(Regd No 1158 of 1983)

EXECUTIVE COMMITTEE: 1999—2001

Siraj A. Taher	President
N.G. Reddy	Vice-President
Walter Sanjeeva Rao	Vice-President
Aasheesh Pittie	Honorary Secretary
K. Bharadwaj	Honorary Treasurer
Gool R. Plumber	Member
Rajeev Mathew	Member
Shafaat Ulla	Member
J.V.D. Moorty	Member
Sushil Kapadia	Member

The Society was founded in 1980 with the objectof spreading the message of bird conservation. Membership of the Society is open to persons of either sex, and of any nationality, scientific societies, institutions, clubs and companies. Corporate membership is available for persons in their official capacity.

SERVICES TO MEMBERS

„ Fortnightly bird-watching field trips „ Lectures, discussions talks „ Monthly film and slide shows „ Annual nature camps and treks „ Participation in national projects like Mid-winter Asian Waterfowl Census & Sálim Ali Bird Count „ Bird ringing for migration studies „ Nature photography opportunities „ Visits to bird sanctuaries and parks „ Field tick-list for Hyderabad and surrounds „ Society ID card „ Access to periodicals, journals and reports on bird studies and conservation „ PITTA the Society's monthly newsletter „ MAYURA the bi-annual journal „

MEMBERSHIP

Admission Fee	Rs.	20	
Ordinary Membership	Rs.	100	per annum
Student Membership*	Rs.	25	per annum
Life Membership	Rs.	1,000	
Corporate Membership	Rs.	2,000	per annum
Foreign Membership	US$	15	per annum in Rs. at prevailing rates

**Available only up to 10th class.*

For information contact:
Honorary Secretary, Birdwatchers' Society of Andhra Pradesh, P.O. Box 45, Banjara Hills, Hyderabad 500034, India.
E-mail: aasheesh@hd1.vsnl.net.in

17.5.2001

MAYURA

VOLUME 13, 1996

Date of Publication: 15-5-2001

CONTENTS

List of Illustrations ii

HERONRIES OF ANDHRA PRADESH
S. Subramanya 1

WETLANDS OF ANDHRA PRADESH, INDIA—STATUS AND PRESSURES
Siraj A. Taher & Ghulam Mohammad Taher 22

SOME INTERESTING BIRD OBSERVATIONS AT GUDUR TANK, NELLORE DISTRICT, ANDHRA PRADESH
Siraj A. Taher 38

BIRDING AT NARSAPUR
J.V.D. Moorty & Vinay Totawar 42

HOUSING PROBLEMS FOR THE BAYAS
J.V.D. Moorty & Vinay Totawar 47

RETURN OF THE SMALL GREEN BEE-EATER *MEROPS ORIENTALIS*
Vinay Totawar 49

CROW-PHEASANT *CENTROPUS SINENSIS* TRYING TO HUNT A LARGE SIZE FROG
Vinay Totawar, J.V.D. Moorty & Svati Totawar 51

BREEDING BEHAVIOUR OF THE HOUSE CROW *CORVUS SPLENDENS*
Hyder Jaffer 53

INDEX 55

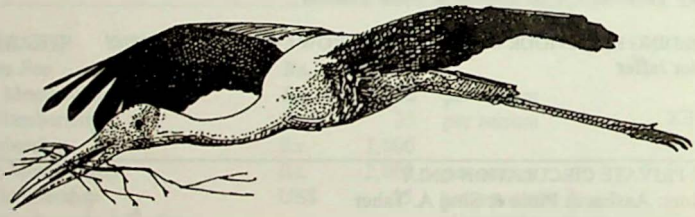
FOR PRIVATE CIRCULATION ONLY
Editors: Aasheesh Pittie & Siraj A. Taher
Illustrations: Sachin Jaltaré

Papers, short-notes, *etc.*, for *Mayura* should be sent to the Honorary Secretary, Birdwatchers' Society of Andhra Pradesh, PO Box 45, Banjara Hills, Hyderabad 500034, India. Or E-mail: aasheesh@hd1.vsnl.net.in

LIST OF ILLUSTRATIONS

Artist: Sachin Jaltare

Painted Stork *Mycteria leucocephala* with nesting material	ii
Darter *Anhinga melanogaster*	11
Spotted-billed Pelican *Pelecanus philippensis*	22
Painted Stork *Mycteria leucocephala* on nest	24
Grey Heron *Ardea cinerea* heronry	26
Wigeon *Anas penelope*	43
Heronry	47
Tailor Bird *Orthotomus sutorius* at nest	52
Small Green Bee-Eater *Merops orientalis*	54
Baya *Ploceus philippinus*	56
Crow-Pheasant *Centropus sinensis*	58
House Crow *Corvus splendens* at nest	59
Dabchick *Tachybaptus ruficollis*	68



HERONRIES OF ANDHRA PRADESH[1]

S. SUBRAMANYA[2]

Colonial nesting is an unique feature among several large waterfowl. Owing to the spatial and temporal clumping of breeding aggregation of these birds, their nest sites are quite conspicuous and can be easily seen. A large number of such heronries are distributed across India (Subramanya 1996). Despite considerable work on the birds of Andhra Pradesh (see the related references in Taher & Pittie 1989, Pittie 1995), very little information is available on the heronries that occur in the state. The available information on heronries of Andhra Pradesh (e.g., Campbell 1902, Whistler & Kinnear 1931-1937, Ali & Whistler 1933-1934, Neelakantan 1949, 1971a & b, 1980, 1981, Gee 1960, 1964, Lamba 1963, Spillett 1968, Lokaranjan 1971, Krishnan 1980, Nagulu 1983, Nagulu & Rao 1981, 1983, Ramakrishna 1986, 1990, Madhav 1988, Perennou & Santharam 1991, Bhat *et al.* 1992, Kumar 1992, Pittie 1992, Rao 1993, Santharam 1993, Peacock 1994, Shivaram 1995, Santharam & Rangaswamy 1999, Rao & Kumar 2000) is inadequate to project a true heronry scenario in the state. This study is an effort to bridge this gap in the ornithology of Andhra Pradesh. The status and distribution of both existing and those heronries that were once active is presented in this paper.

The information presented in this paper was gathered as a part of a much larger study of heronries in India (Subramanya 1993, 1996). A number of birdwatchers, ornithologists and naturalists were contacted (see Annexure) and the details on heronries known to them were collected. At the same time, the information on heronries in published literature was also freely drawn on. The accuracy of the information obtained through these sources has been relied on completely. The contributors either provided the co-ordinates of the nesting sites or they were extracted from a 1:1,000,000 scale Survey of India map of the state based on the details provided on their location. The nomenclature of the species considered follows that of the Asian Wetland Census (Perennou & Mundkur 1992).

Details on the nesting sites of 20 large colonial nesting waterbirds namely, Spot-billed Pelican *Pelecanus philippensis* (SBP); Great Cormorant *Phalacrocorax carbo* (GC); Indian Shag *P. fuscicollis* (IS); Little Cormorant *P. niger* (LC); Oriental Darter *Anhinga melanogaster* (OD); Night Heron *Nycticorax nycticorax* (NH); Pond Heron *Ardeola grayii* (PH); Cattle Egret *Bubulcus ibis*

[1] Received for publication (revised Mss.): 28 April 2001.
[2] *Address for communication*: PHT Scheme, 'J' Block, G.K.V.K. Campus, University of Agricultural Sciences, Bangalore 560065, India. *E-mail*: subbus@vsnl.com

(CE); Western Reef Egret *Egretta gularis* (WRE); Little Egret *E. garzetta* (LE); Smaller Egret *E. intermedia* (SE); Great Egret *E. alba* (GE); Purple Heron *Ardea purpurea* (PrH); Grey Heron *A. cinerea* (GH); Painted Stork *Mycteria leucocephala* (PS); Asian Openbill *Anastomus oscitans* (OBS); Woolly-necked (White-necked) Stork *Ciconia episcopus* (WNS); Black-headed (White) Ibis *Threskiornis melanocephalus* (BHI); Black Ibis *Pseudibis papillosa* (BI); and White Spoonbill *Platalea leucorodia* (WSB) were collected as a part of the survey.

Distribution of Heronries: The study revealed that, 41 active heronries are found in Andhra Pradesh (Appendix I). In addition, 19 sites were found to have been active in the past (Appendix II). These 60 sites were found distributed in 16 districts of the state. Mapping the distribution of these 60 heronries shows a major concentration in the coastal region made up of nine districts bordering the 970km coastline (Fig. 1, Table 1), followed by their occurrence in Medak, Rangareddi, Mahbubnagar, Nizamabad and Warangal districts of Telangana and only from the Anantapur, Cuddapah and Chittoor districts in the Rayalseema (Fig. 1). The lack of heronries in other regions may not be due to their absence, but may well be due to lack of any reports on them. Even though several heronries are suspected to occur at several other sites (Table 2), the survey could not confirm their existence.

The distribution of heronries in the state also shows that they occur within the semi-arid and coastal plains of Andhra Pradesh and that the species nesting in heronries clearly avoid the Eastern Ghats. The Eastern Ghats which marks the eastern borders of the peninsular plateau, extend from the extreme northeast (to the south of Chota Nagpur plateau), to the extreme southwest corner of the Peninsula (Mani 1974). In Andhra Pradesh, two divisions of the Eastern Ghats can be recognised. The northern division is bounded in the south by the Godavari-Krishna Gap. To the south of the wide Godavari-Krishna Gap, where the Eastern Ghats are interrupted, lies the middle section of the Deccan division of the Eastern Ghats and it continues south of the River Krishna by the Nallamalai Hills, extending from Guntur through Kurnool and beyond the Cuddapah districts (Mani 1974). The distribution of the heronries within these coastal districts indicates that the Godavari-Krishna Gap influences their occurrence significantly. Nearly fifty per cent of the heronries (both lost and active) in the coastal districts of Andhra occur within this gap, which spreads over Guntur, Krishna and, East and West Godavari districts.

For the occurrence of heronries, the availability of suitable feeding conditions appears to be the ultimate factor, while availability of suitable nesting substrates influences proximally (Subramanya 1996). The coastal districts of Andhra where a major concentration of heronries occur (24 existing and 13 lost sites; Table 1), is low-lying with extensive alluvial flood plains and deltas. Within

the coastal region again, a majority of the heronries are found within a 35-40km belt along the coastline, indicating that the coastal wetlands (estuaries, mangroves, creeks and lagoons) are a major influencing factor in their occurrence. The coastal region of Andhra also comprises of Pulicat Lagoon and Kolleru Lake, two of the largest natural wetlands in the state. For example, the Pulicat Lagoon itself appears to support four existing heronries. The vast area of Kolleru Lake with its associated marshes situated between Krishna and Godavari rivers has supported nearly seven heronries including the sites that were once active in the past. On the other hand, the occurrence of heronries in the inland region is mainly influenced by large reservoirs built under irrigation projects, numerous man-made tanks that occur throughout the state and the natural lakes. In addition, the river Penneru, the tributaries of rivers Godavari and Krishna that flow towards the sea and their estuaries appear to play an important role in providing the much needed feeding conditions for the birds nesting in heronries in coastal districts. Some excellent areas of mangrove forest exist in the Godavari and Krishna deltas.

Nesting Species in Heronries: Among the 20 species found nesting in the heronries of Andhra Pradesh, Little Cormorant, Pond Heron, Cattle Egret, Little Egret, Grey Heron and the Asian Openbill, were the most common and were fond nesting in more than 10 sites (Fig. 2). Of these, the Little Egret was found nesting in 19 heronries followed by Little Cormorant, Cattle Egret and Asian Openbill nesting in 18, 18 and 15 heronries, respectively (Fig. 2; Appendix I). On the other hand, Oriental Darter, Purple Heron, Wooly-necked (White-necked) Stork and Black Ibis were the least represented species in the heronries (Fig. 2). Over the years nine nesting sites of Spot-billed Pelican (including the five sites under the Kolleru group), three sites each of Painted Stork, two sites each of Grey Heron and Pond Heron, one each of Cattle Egret, Western Reef Egret, Little Egret, Great Egret, Asian Openbill and White Spoonbill have been lost (Fig. 2, Appendix II).

Though the major concentration of Reef Egrets is undoubtedly in the coastal districts of Gujarat (Naik, *et al.* 1991, Naik & Parasharya 1988, Parasharya & Naik 1990, Subramanya 1996), the occurrence of nesting colonies of the species in Krishna Mangroves (Prasad 1992), coastal Nellore (Kirkpatrick 1961), Mandapalle (V. Vasudeva Rao & Nagulu, *pers. comm.*) and Coringa Wildlife Sanctuary (Ashok Kumar, *pers. comm.*) clearly indicate that the species does breed on the East Coast. Only intensive searches along the East Coast, especially among mangrove dominated patches may bring to light several new colonies of the species. The nesting of this species in the state thus updates its status (Taher & Pittie 1989) as a nesting resident.

Habitats of Heronries: The birds nesting in heronries in Andhra Pradesh were found to occupy nine different habitat conditions (Table 3). Of these, nearly 50% of the sites were found within human habitations (villages, towns and cities). Other important habitats preferred included trees found close to fresh-water waterbodies and among cultivation. Tree-nesting among birds nesting in heronries, appear to be a defense against terrestrial predators (Subramanya, unpublished). The choice of sites like trees amidst human habitations and cultivation seem to provide immunity from predators, as the intense human activity in these habitats keeps predators away. Similarly, nesting on trees growing inside waterbodies appears to safeguard the nesting birds from such predators. The nesting of Spot-billed Pelican in the aviary at the Nehru Zoological Park, may reflect the adaptability of the species to the availability of suitable nesting conditions and an assured food supply.

Nesting Seasonality: A large majority of birds (SBP, GC, LC, OD, NH, LE, SE, GH, PS, OBS, BHI, WSB) breed during winter and early summer (September-April). Very few species are strictly monsoon nesters. The nesting seasonality in different heronries (Appendix II) indicates the presence of double nesting seasons among the Little Cormorant, Little Egret and Asian Openbill. Though the Western Reef Egret is known to breed from February-September in Gujarat (Ali 1954, Naik, *et al.* 1981, Naik & Parasharya 1988, Parasharya & Naik 1990), its restricted breeding season of April-May on the east coast of Andhra Pradesh (Kirkpatrick 1961) needs to be confirmed.

Size of Heronries in Andhra Pradesh: Very few large heronries occur in Andhra Pradesh (Table 4). With the exception of the heronries at Telikunchi, the largest heronry in India (Subramanya 1996), Manjira Barrage and Chudavaram, most of the existing sites have a colony size of less than 500 pairs. Based on the information provided by contributors, Table 5 lists the top ten heronries of Andhra Pradesh. The ten nesting sites thus identified, range from 250□25000 nesting pairs in terms of the size of nesting colonies. The diversity of nesting species, range from a single species colony to as many as twelve species in a single heronry. Of these, the Asian Openbill colony at the Telikunchi village ranks as the largest with respect to abundance of nesting birds, while the Manjira Barrage heronry has the highest diversity of nesting birds in the state (Table 5). As the abundance of nesting birds in heronries changes over time, there is a need to keep track of nesting activities to update abundance of birds and nesting species in them.

Reduction in the colony size and the number of nests appear to be a general trend in most of the heronries of Andhra Pradesh. For example, in heronries at Ichapuram, Kanigiri Reservoir, Mandapalle Village, Puniakshetram, Nellapattu

and, Telineelapuram, there has been a noticeable decrease in bird and nest numbers (V. Vasudeva Rao & V. Nagulu *pers. comm.*).

Loss of Heronries: Over the years, about 19 heronries have been lost (Appendix II). Though the reasons for the loss of all the heronries are not known, the available information indicates that, the nesting sites located in the coastal districts of Andhra and adjoining districts are prone to the devastating effects of cyclones in the Bay of Bengal. The most severe effect of such storms, accompanied by gusty winds that often reach velocities of over 150 km/h, has been the damage to trees utilised for nesting by birds. At Tsunduru Village heronry, one of the nesting trees was damaged by a cyclone in 1991 (K. Mrutyumjaya Rao, *pers. comm.*) and even at Ethirapattu (= Vedurupattu, Edurubatta), a huge Tamarind tree utilised for nesting was uprooted in the November 1984 cyclone (Ramakrishna 1990). The Cuddapah Town heronry was abandoned after the tree was uprooted during a cyclonic storm in 1989 (Riyazuddin, *pers. comm.*). The birds nesting at Jarugumilli Village abandoned the site when their nesting substrate was destroyed in a cyclone in 1979. Following this, the birds shifted to Patchava Village (K. Mrutyumjaya Rao, *pers. comm.*).

But for the heronries at Nellapattu, Telineelapuram, Coringa Wildlife Sanctuary and, Manjira Barrage, most of the heronries do not enjoy protection either by state or by people. As elsewhere (Subramanya 1996), heronries located in villages are safe as long as the nesting activities of birds do not come into conflict with the interests of local people. For example, at Atapaka Heronry, nearly 30 *Acacia nilotica* trees were cut down by villagers to avoid the stench emanating from the rotting guano and the fish that fell from the nests in these trees (K. Mrutyumjaya Rao, *pers. comm.*). Similarly at Uppalapadu, a considerable extent of the nesting substrate that was growing within the village tank was removed to discourage nesting by birds, as the guano was polluting the waters that the villagers often used for domestic purposes (K. Mrutyumjaya Rao, *pers. comm.*). Another problem that troubles the nesting of birds is a sporadic, if not regular, poaching of eggs and nestlings. Commercial exploitation of Spot-billed Pelican eggs and nestlings was one of the reasons for its abandoning the Kolleru Pelicanry (Neelakantan 1971), even though, changes in the land-use pattern by replacing the Palmyra Palm *Borassus flabellifer* nesting substrates by Coconut and possible excessive pesticide use, are also considered to be responsible for the loss of the pelicanry (Nagulu 1995, Guttikar 1978).

Often, it is difficult to trace the present day locations of the pelicanries and heronries that once existed in Andhra Pradesh. The village Buchupalle, located in a secluded valley in the extreme east of Cuddapah district, where Campbell (1902) discovered a nesting colony of Spot-billed Pelicans, could well be the

present day Buchureddipalem. The "Pulla Goora Pully" (*sic* Pullagurapalle) pelicanry that J. Shortt discovered about 48 miles northeast of Cuddapah (Hume 1881) was probably located in northern Nellore district, while the other pelicanry (Shortt Pelicanry) that he found about 70 miles northeast of Cuddapah (Hume 1881) could have occurred close to Kandukur town in Prakasam district. The exact location of the Reef Egret colony (Kirkpatrick Heronry) discovered by Kirkpatrick (1961) on the coast of Nellore where the birds were breeding in a grove of *Ficus* trees, about 400m due east of forest bungalow on the northeast bank of the estuary is not known even though the site appears to have existed somewhere between Maipadu and Pulicat Lake (Kirkpatrick 1961), possibly at Gudur on the coast. Also, the location of a colony of reed-nesting Spoonbills at Kolair (Kolleru) Lake found by D. Hatchel (Baker and Inglis 1930) and the breeding colony of Painted Storks visited by B. Burgess in February, in a village about 10 miles from the Godavari river (Hume and Oates 1890) are not known. The latter colony appears to have been a large one as substantial quantities of fish were dropped by birds returning from foraging and, were collected and eaten by villagers (Hume and Oates 1890). The pelicanry at Gunaparam, from which H.E. Barnes and H. Morris and an un-named collector collected three sets of eggs on December 29, 1882 could very well have been the Ganapavaram Pelicanry in West Godavari district, where Gee (1960) found a small colony of 25 nests during January 1960. However, the label data that accompanies the eggs in the Stuart Baker, Crowfoot and Davidson Collections at British Museum of Natural History (BMNH), to which these eggs respectively belong, indicate that the colony was found on the banks of Godavari, in heavy forest. Considering this, it appears that the Gunaparam colony could have possibly occurred at Gunnavaram, located on the banks of Godavari in East Godavari district.

Despite the loss of the pelicanries close to Kolleru Lake (Guttikar 1978, Gee 1960, 1964, Neelakantan 1949, 1971b), as indicated by Nagulu and Rao (1981), Andhra Pradesh continues to be the traditional home of Spot-billed Pelicans. The pelicanries at Aredu, Sarepalle and Chilakalampada (Neelakantan 1949), Kolamaru and Ganapavaram (Gee 1960), which were collectively referred to as Kolleru Pelicanries (Lamba 1963), constituted the largest known breeding population of the species in India with about 3,000 birds. Even though the pelicanries at Kolleru were discovered by Neelakantan (1949) and, Gee (1960), records of four pelicanries: two northeast of Cuddapah (Pullagurapalle and Shortt Pelicanry: Hume 1881), the one at Buchupalle (Campbell 1902) and another on the forested banks of Godavari at Gunaparam (BMNH egg collection) were probably the earliest nesting colonies of the species discovered within Indian limits.

It is not certain how long heronries survive at a given site in the absence of continued protection. Disturbance during nesting or destruction effected to

nesting substrates may force the birds to abandon and often reoccupy such favoured sites. Such a nesting pattern was seen in the Kolleru Pelicanries (Neelakantan 1949, Gee 1960, Lamba 1963). Also, the re-nesting of Spot-billed Pelicans at Ethirapattu (Santharam 1998) after a gap of several years further supports this observation.

Future of heronries of Andhra Pradesh: The information on heronries in Andhra Pradesh is by no means comprehensive. Though the present heronry survey has brought to light only about 60 heronries including both the existing sites and those once in use, it could well be a small proportion of the true heronry scenario in Andhra Pradesh. Elsewhere, intensive searches for heronries have revealed a high concentration of heronries in a single district (Subramanya 1996). The mid-winter waterfowl census estimates of large colonial nesting waterbirds (van der Ven 1987, Scott & Rose 1989, Perennou *et al.* 1990, Perennou & Mundkur 1991, 1992) show that a sizeable wild population of the 20 species considered in this paper, occur in Andhra Pradesh. However, the nesting populations of most of these species do not match the population estimates during the mid-winter counts. This only makes one realize that there could still be many more heronries that have not been catalogued. Considering this, concerted efforts are needed to develop regional inventories of heronries at district or taluk level and integrate them to project a true picture of the heronry scenario in Andhra Pradesh. In this direction, individual birdwatchers, ornithologists, governmental and non-governmental agencies can contribute immensely. In looking for heronries, it is worthwhile to explore the region around major reservoirs or in regions where there is an increased concentration of waterbodies. Figure 3 shows a distribution of waterbodies across Andhra Pradesh that are above 1 km^2 in extent. If intensive surveys are taken up, one could show a distribution of heronries matching closely with the distribution of wetlands indicated in Figure 3. Once the inventory has been developed, efforts should be directed to identify heronries with a high density and diversity of nesting birds for long-term conservation.

There are only a few traditional heronries in Andhra Pradesh (e.g., Nellapattu, Telineelapuram, Ethirapattu, and Veerapur). Long term protection to selected heronries can increase the number of such traditional sites as, continued protection to heronries is known to result in an increase in both the number of nesting species and the colony size over time, as seen in the Simpson Estate heronry in Tamil Nadu (Subramanya 1996).

As a majority of the heronries in Andhra Pradesh could be found in or near villages, efforts should be made to involve the villagers in the conservation of these sites. Towards achieving this, the local people need to be educated and actively involved in the conservation of the nesting sites selected for

conservation. Protection against any form of disturbance including poaching of eggs and birds or, felling or damage to trees utilised for nesting should be prevented. Conservation programmes should consider regular planting of preferred tree species to augment the requirement of nesting substrates in future and also for the replacement of trees destroyed due to natural causes, as seen at Nellapattu (Taher 1985), Cuddapah (Riyazuddin, *pers. comm.*) and Jarugumulli (K. Mruthumjaya Rao, *pers. comm.*).

Wherever possible, local people living close to the heronries should be encouraged to harvest the guano that collects below trees used for nesting by birds. For example, at Kokkare Bellur Pelicanry in Karnataka (Subramanya & Manu 1996), every year during the nesting season, local villagers regularly spread farmyard refuse, hay, dung and several cartloads of soil or red earth below the nesting trees to collect the bird droppings. During early monsoon, the partially or completely decomposed guano rich manure is removed from below these trees and used as fertilizer for crops. Development of a similar practice in the villages of Andhra Pradesh harbouring heronries should encourage farmers to take active part in protecting the nesting sites.

ACKNOWLEDGEMENTS

I am very grateful to all the contributors who readily responded to my information requests and sent me the details on the heronries known to them. The study was partially supported by a Small Conservation Grant by the Oriental Bird Club, U.K. I thank Siraj Taher and Aasheesh Pittie for their comments on the drafts of this paper. I also thank Dr Michael Walters for providing access to the egg collections at the British Museum of Natural History, Tring, England.

REFERENCES

Ali, S. (1954): The Birds of Gujarat. *J. Bombay nat. Hist. Soc.* 52: 374-458.

Ali, S. & Whistler, H. (1934): The Hyderabad State ornithological survey. Part V. *J. Bombay nat. Hist. Soc.* 37: 426-454.

Anonymous (1997): Editorial. *Pitta.* 72: 1, 4.

Baker, E.C.S. (1935): *Nidification of the Birds of the Indian Empire.* Vol. 4. Taylor and Francis. London.

Baker, H.R. & Inglis, C.M. (1930): *The Birds of Southern India, Including Madras, Malabar, Travancore, Cochin, Coorg and Mysore.* Madras. Government Press.

Bhat, H.R., Jacob, P.G. & Jamgaonkar, A.V. (1992): Observations on a breeding colony of Painted Stork *Mycteria leucocephala* (Pennant) in Anantapur Dist., Andhra Pradesh. *J. Bombay nat. Hist. Soc.* 88, 443-445.

Campbell, W.H. (1902): Nesting of Grey Pelican (*Pelecanus philippensis*) in Cuddapah District, Madras Presidency. *J. Bombay nat. Hist. Soc.* 14, 401.

Gee, E.P. (1960): The breeding of the Grey or Spotbilled Pelican (*Pelecanus philippensis philippensis* (Gmelin). *J. Bombay nat. Hist. Soc.* 57: 245-251.

Gee, E.P. (Ed.) (1964): *The Wildlife of India*. Collins, London.

Guttikar, S.N. (1978): Lost Pelicanry. *J. Bombay nat. Hist. Soc.* 75:482-484.

Hume, A.O. (1881): Our Indian pelicans. *Stray Feathers*. 10: 487-502.

Hume, A.O. & Oates, E.W. (1890): *Nests and Eggs of Indian Birds*. 2nd edition. Vol. 3. R.H. Porter, London.

Kirkpatrick, K.M. (1961): The Ashy Reef Heron *Egretta gularis* (Bosc.) on the east coast. *J. Bombay nat. Hist. Soc.* 58: 275.

Krishnan, M. (1980): The availability of nesting materials and nesting sites as vital factors in gregarious breeding of Indian water-birds. *J. Bombay nat. Hist. Soc.* 75, 1143-1152.

Kumar, V.V. (1992): Breeding seasons of some wetland birds of Manjira. *Mayura*. 9: 19.

Lamba, B.S. (1963): Nidification of some common Indian Birds, no.7: The Spotbilled or Grey Pelican. *Pavo*. 1: 110-119.

Madhav, B.R. (1988): Ecobiological studies of survival value to the Grey Pelican during winter sojourn at Nellapattu in Andhra Pradesh. Unpublished Ph.D. Thesis.

Mani, M.S. (1974): The vegetation and phytogeography of the Eastern Ghats. Pp. 197-203. M.S. Mani (*ed.*) in *Ecology and biogeography of India*. Netherlands: W. Junk b.v. Publishers, The Hague.

Mundkur, T. and Taylor, V. (1993): *Asian Waterfowl Census 1993*. AWB, Kuala Lumpur, Malaysia and IWRB, Slimbridge, U.K.

Nagulu, V. (1983): *Feeding and Breeding Biology of Grey Pelican at Nelapattu Bird Sanctuary in Andhra Pradesh, India*. Ph.D. Thesis, Osmania University, Hyderabad. 161 pp.

Nagulu, V. (1995): Conservation issues of pelicans. Pp. 41-42 in L. Vijayan, ed. *Avian Conservation in India*. SACON. Coimbatore.

Nagulu, V. & Rao, J.V.R. (1981): Andhra Pradesh still the traditional home of pelicans. *Hornbill*. 1981 (3): 30-31.

Nagulu, V. & Rao, J.V.R. (1983): Survey of south Indian pelicanries. *J. Bombay Nat. Hist. Soc.* 80(1): 141-143.

Nagulu, V., Kumar, S.T. & Rao, J.V.R. (1981): Pity the pelican. *Tigerpaper*. 8(2): 19-20.

Naik, R.M. & Parasharya, B.M. (1988): Impact of the food availability, nesting-habitat destruction and cultural variations of human settlements on the nesting distribution of a coastal bird, *Egretta gularis*, in Western India. *J. Bombay Nat. Hist. Soc.* 84: 350-360.

Naik, R.M., Parasharya, B.M., Patel, B.H. & Mansuri, A.P. (1981): The timing of breeding season and interbreeding between the colour phases in the Indian Reef Heron, *Egretta gularis* (Bosc.). *J. Bombay Nat. Hist. Soc.* 78: 494-497.

Naik, R.M., Murthy, M.S., Mansuri, A.P., Rao, Y.N., Parvez, R. Mundkur, T., Krishnan, S., Faldu, P.J. & Krishna, T.S.V.R., (1991): WWF-India sponsored project on Coastal Marine ecosystems and anthropogenic pressures in the Gulf of Kachchh. Final report. Department of Biosciences, Saurastra University, Rajkot, Gujarat, India.

Neelakantan, K.K. (1949): A South Indian pelicanry. *J. Bombay nat. Hist. Soc.* 48: 656-666.

Neelakantan, K.K. (1971a): The pelicanry at Kolamuru. *Newsletter for Birdwatchers* 11(4): 1-3.

Neelakantan, K.K. (1971b): In memoriam Kolleru pelicanry. *Newsletter for Birdwatchers.* 11(8): 7-8.

Neelakantan, K.K. (1980): A pelican's pathetic plight. *Tigerpaper.* 7: 21-24.

Neelakantan, K.K. (1981): A project for the Eighties: Saving the Spotbilled Pelican. *Hornbill.* 1981(1): 21-24.

Parasharya, B.M. and Naik, R.M., (1990): Ciconiiformes birds breeding in Bhavnagar City, Gujarat: A study of their nesting and plea for conservation. Pp. 429-445 in J.C. Daniel and J.S. Serrao (*eds.*), *Conservation in developing countries: problems and prospects.* Proceedings of centenary seminar of Bombay Natural History Society. Bombay: Bombay Natural History Society/ Oxford University Press.

Peacock, M. (1992): Birds of ICRISAT Campus - Part 1. *Mayura* 9: 1-10.

Perennou, C. & Mundkur, T. (1991): *Asian Waterfowl Census 1991,* IWRB, Slimbridge, U.K.

Perennou, C. & Mundkur, T. (1992): *Asian Waterfowl Census 1992,* IWRB, Slimbridge, U.K.

Perennou, C., Rose, P. & Poole, C. (1990): *Asian Waterfowl 1990.* IWRB, Slimbridge, U.K.

Perennou, C. & Santharam, V. (1991): An ornithological survey of some wetlands in south-east India. *J. Bombay nat. Hist. Soc.* 87: 354-363.

Pittie, A. (1992): Iris colour in breeding Median Egrets *Egretta intermedia. Mayura.* 9: 20.

Pittie, A. (1995): *A Bibliographic Index to the Ornithology of the Indian Region - Part I.* Published by the Author. Hyderabad.

Prasad, S.N. (1992): An ecological reconnaissance of mandals in Krishna estuary: Plea for conservation. In K.P. Singh & J.S. Singh (*eds.*), *Tropical Ecosystems: Ecology and Management.* Weily Eastern Ltd. New Delhi.

Ramakrishna, C. (1986): Edurupattu - A home for the Painted Storks. *Blackbuck.* 2(2): 25-26.

Ramakrishna, C. (1990): Vedurupattu - Painted Stork *Mycteria leucocephala* nesting place. *Mayura.* 7&8(1-4): 34-35

Rao, K.M. (1993): Openbill Storks *Anastomus oscitans* of Tsunduru, Andhra Pradesh. *Mayura.* 10: 37.

Rao, K.M. & Kumar, K.R. (2000): Arrival of Spotbilled Pelicans at Uppalapadu. *Newsletter for Birdwatchers.* 40(1): 14.

Santharam, V. (1993): Nelapattu—Time to sound the alarm. *Mayura.* 10: 34-35.

Santharam, V. (1998): An evening at Vedurupattu. *Blackbuck.* 14: 9-13.

Santharam, V. & Rangaswamy, S. (1999): Discovery of new heronries. *Newsletter for Birdwatchers.* 39(1): 3-4.

Scott, D.A. & Rose, P.M. (1989): *Asian Waterfowl 1989.* IWRB, Slimbridge, U.K.

Shivram, S.V.N. (1995): *Comparative ecological studies on Pelecaniformes at Nelapattu Bird Sanctuary.* Ph.D. thesis study in progress. Osmania University, Hyderabad, Andhra Pradesh.

Shortt, J. (1865): Account of a heronry, and breeding-place of other water-birds, in southern India. *J. Linn. Soc. Zool.* 8: 94-100.

Subramanya, S. (1993): Information Request: Catalogue of Indian heronries. IWRB News. 9: 11.

Subramanya, S., 1996: Distribution, status and conservation of Indian Heronries. *J. Bombay Nat. Hist. Soc.* 93: 459-486.

Subramanya, S., (Unpublished): Catalogue of Indian Heronries.

Subramanya, S. & Manu, K. (1996): Saving Spotbilled Pelicans at Kokkare Bellur. *Hornbill.* 1996(2): 2-5.

Taher, S.A. (1985): Nellapattu and Pulicat Bird Sanctuaries in Andhra Pradesh after the November, 1984 cyclone. *Mayura.* 6(1-4): 21-25.

Taher, S.A. & Pittie, A. (1989): *A Checklist of Birds of Andhra Pradesh.* Published by the authors, Hyderabad.

van der Ven, J. (1987): *Asian Waterfowl 1987: Midwinter Bird Observations in some Asian Countries.* IWRB, Slimbridge, England.

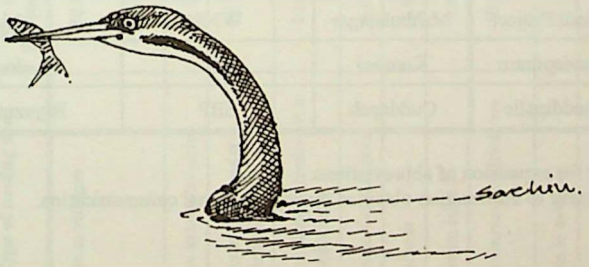


TABLE 1
DISTRIBUTION OF HERONRIES IN DIFFERENT REGIONS OF ANDHRA PRADESH

Region	Heronries	
	Existing	Lost
Rayalseema	6	3
Coastal Andhra	24	13
Telangana	11	3

TABLE 2
HERONRIES THAT ARE SUSPECTED TO OCCUR IN ANDHRA PRADESH

Name of the heronry	District	Nesting species[1]	Source[2]
Gharepalli	Karimnagar	BHI, BI	Divya Muddappa
Ramappa	Warangal	OBS, BHI	-do-
Nirkula	Warangal	OBS, BHI	-do-
Dindi Project	Mahbubnagar	WNS	-do-
Siddapuram	Kurnool	BHI	-do-
Reddipalle	Cuddapah	SBP	Riyazuddin

[1] See text for expansion of abbreviations.
[2] Names refer to information obtained through personal communication.

TABLE 3: SITES PREFERRED BY COLONIAL NESTING WATERBIRDS IN ANDHRA PRADESH

Type of nesting sites	Per cent Frequency[3]	Name of the heronries
Trees in villages	38.33	Bordilinganapada, Buchupalle Village, Budham village, Burgess, Chudavarum, Ethirapattu, Gantavarum, Jarugumulli, Labaku, Mandapalle, Narasapur Town, Navipet, Parkal, Patchava, Pulla Goora Pully Pelicanry, Puniakshetram Village, Shortt Pelicanry, Telikunchi, Telineelapuram, Tsunduru Village, Veerapur Village, Velamavari Palem Village, Venkatapura Village.
Trees in towns / cities	8.33	Anakapalle, BHEL Township, Cuddapah Town, Hyderabad School, Vijayawada.
Trees in fresh-water waterbodies	10.00	Bayi Cheruvu, Ichapuram, Nellapattu Bird Sanctuary, Pedda Tippa Samudram, Uppalapadu village tank, Veltur.
Trees close to fresh-water waterbodies	20.00	Ambarjiepet Tank, Atapaka Village, ICRISAT Campus, Gunnavaram Pelicanry, Lakshmapura Lake, Kanigiri Reservoir, Kolleru Lake, Nayana Cheruvu, Palmakole Tank, Pakhal Lake, Tada.
Trees in Coastal area	6.67	Coringa Wildlife Sanctuary, Lankavanidibba, Krishna Mangroves, Kirkpatrick, Mettapalem.
Reedbeds	1.67	Kolair (*sic* Kolleru).
Trees on islands	1.67	Manjira Barrage.
Trees among cultivations	10.00	Aredu Pelicanry, Chilakalampada Pelicanry, Kolamaru Pelicanry, Rasupalle, Sangaipelta & Rangampet Border, Sarepalle Pelicanry.
Trees in aviaries	1.67	Nehru Zoological Park.

Not known	1.67	Eruru.

[3] N = 60 sites.

TABLE 4: COLONY SIZE IN THE HERONRIES OF ANDHRA PRADESH

Number of nests	Name of heronries
1-50	Anakapalle, Budham Village, Bayi Cheruvu, Cuddapah town, Labaku, Mettapalem, Rasulpalle, Sangaipelta & Rangampet Border, Velamavari Palem Village.
51-100	Atapaka Village, BHEL Township, Patchava, Tsunduru Village, Bordilingunapada, Veltur.
101-200	Ichapuram, ICRISAT Campus, Kanigiri, Puniakshetram Village.
201-500	Ethirapattu, Mandapalli, Pedda Tippa Samudram, Veerapur Village, Vijayawada, Telineelapuram.
501-1000	Nellapattu Bird Sanctuary, Uppalapadu village tank.
1001-2000	Manjira Barrage.
2001-5000	Chudavarum.
25,000	Telikunchi.

TABLE 5: TOP TEN HERONRIES OF ANDHRA PRADESH

Name of the heronry	No. of nesting species	No. of pairs/nests
Telikunchi	1+	25,000*
Chudavaram	1	2500
Manjira Barrage	12	1250?
Nellapattu	9	1000
Uppalapadu	7	750
Telencelapuram	2	660
Vijayawada	3	350
Veerapur	2	335
Ethirapattu	5	273
Atapaka	2	250
Mandapalle	1	250

* Bivash Pandav considers that the colony may be as large as it has been reported to be and the bird numbers could well be around 10,000 strong.

Appendix I
DETAILS OF EXISTING HERONRIES OF ANDHRA PRADESH

Name of the Heronry	District	Nesting species[1]	Nesting Season	Source[2]
Telikunchi	Srikakulam	OBS	NK[3]	U.N. Dev, Divya Muddappa, Bivash Pandav*.
Ichapuram	Srikakulam	OBS	June-Nov	V. Vasudeva Rao & V. Nagulu.
Telineela-puram	Srikakulam	SBP,PS	Oct-June	Nagulu & Rao, 1983; V. Vasudeva Rao & V. Nagulu; M.M.L. Kumar; Divya Muddappa, B.C. Choudhury & D. Reddy; K. Mrutyumjaya Rao; S. Ashok Kumar.
Ambarjiepet Tank	Medak	LC,GH, PS,BH	Feb	Divya Muddappa & B.C. Choudhury.
ICRISAT Campus	Medak	GC,NH, GH.BI	Jan-April	Siraj A. Taher, Aasheesh Pittie; Peacock, 1992; S. Ashok Kumar.
Narasapur Town	Medak	CE,SE	August	Pittie, 1992.
Sangaipelta & Rangampet Border	Medak	LE,GH	March	Divya Muddappa & B.C. Choudhury.
Manjira Island	Medak	GC,IS, LC,OD, PH,CE. LE,SE, GE,GH, PS,OBS	Feb-Dec	Aasheesh Pittie; Anon, 1997; S. Ashok Kumar; Kumar, 1994, Anon 1997.
Pakhal Lake	Warangal	IS,LC,P H,CE,L E,SE,G H,OBS	NK	S. Ashok Kumar.

Name of the Heronry	District	Nesting species[1]	Nesting Season	Source[2]
Anakapalle	Visakhapat-nam	LC	Aug	Mohamed Jafer Palot.
Hyderabad School	Rangareddi	Egrets	??	Aasheesh Pittie
BHEL Township	Rangareddi	GH,LC	Dec-June	V. Vasudeva Rao & V. Nagulu.
Puniakshet-rani Village	East Godavari	OBS	June-Nov	V. Vasudeva Rao & V. Nagulu.
Mettapalem	East Godavari	WRE	NK	V. Vasudeva Rao & V. Nagulu.
Coringa Wildlife Sanctuary	East Godavari	LC,NH, PH,CE, WRE,L E,OBS	NK	S. Ashok Kumar.
Mandapalli	East Godavari	CE	May-Sept	V. Vasudeva Rao & V. Nagulu.
Kolleru Lake	West Godavari	LC,NH, PH,CE. LE,ME. GE,OBS	Oct-March	S. Ashok Kumar.
Chudavarum	West Godavari	OBS	NK	Divya Muddappa & B.C. Choudhury.
Veltur	Mahbub-nagar	PH,CE. LE,GH. BH	NK	S. Ashok Kumar
Lakshma-pura Lake	Mahbub-nagar	PH,CE. LE,GE. WNS	NK	S. Ashok Kumar.
Palmakole Tank	Mahbub-nagar	LC,PH. CE,LE. PH	NK	S. Ashok Kumar.
Atapaka Village	Krishna	CE,LE	May-Sept	V. Vasudeva Rao & V. Nagulu.
Vijayawada	Guntur	LC,NH. LE	Feb-April	Divya Muddappa & B.C. Choudhury.

Name of the Heronry	District	Nesting species[1]	Nesting Season	Source[2]
Tsunduru Village	Guntur	LC,CE, LE,OBS	July-Jan	K. Mrutyumjaya Rao, K. Ramana Kumar, K. Srinivasa, P.Dilip Kumar, S.P. Reddy.
Uppalapadu Tank	Guntur	SBP,LC, NH,CE, LE,PS,O BS	Feb-April	B.C. Choudhury, Divya Muddappa & Koteshwara Rao; K. Mrutyumjaya Rao, K. Ramana Kumar, K. Srinivasa, P.Dilip Kumar & S.P. Reddy, Rao & Kumar 2000.
Budham Village	Guntur	LC	July-Oct	K. Mrutyumjaya Rao.
Lankavanidi bba, Krishna Mangroves	Guntur	GC,IS,N H,PH, CE,WR E,GE,G H,OBS, WSB	NK	Narendra Prasad; Prasad, 1992.
Velamavari Palem Village	Prakasam	OBS	Dec-Jan	K. Mrutyumjaya Rao.
Gantavaram	Prakasam	PS	NK	Divya Muddappa & B.C. Choudhury.
Patchava	Prakasam	OBS	Dec-Jan	K. Mrutyumjaya Rao.
Veerapur Village	Anantapur	GH,PS	Jan-June	Bhat *et al.*, 1992; Divya Muddappa & B.C. Choudhury.
Rasupalle	Cuddapah	PH,CE, LE	June-July	Riazuddin.
Labaku	Cuddapah	PH,CE, LE	NK	Riazuddin.
Bordilingama pada	Nellore	LC,GH	Jan-March	Divya Muddappa & B.C. Choudhury.
Ethirapattu	Nellore	SBP,LC, LE,PS, WSB	Oct-April	V. Nagulu & J. Joel Prashanth; Divya Muddappa & B.C. Choudhury; Ramakrishna, 1986;

Name of the Heronry	District	Nesting species[1]	Nesting Season	Source[2]
				Perennou & Santharam, 1991, Philip *et al.* 1998, Santharam 1998.
Kanigiri Reservoir	Nellore	LC.PH, CE.LE	May-Sept, Oct-April (LE)	J. Joel Prashanth & Nagulu; V. Vasudeva Rao; Divya Muddappa & B.C. Choudhury.
Nellapattu Bird Sanctuary	Nellore	SBP, LC,NH, PH,CE, LE, OBS, BHI, WSB	Oct-March	Prakash Rao; Divya Muddappa & B.C. Choudhury; S. Ashok Kumar; Nagulu; Nagulu, 1983; Madhav, B.R., 1988; Perennou & Santharam, 1991.
Tada	Nellore	LC,GH	Oct-April	V. Nagulu & J. Joel Prashanth; Perennou & Santharam, 1991.
Nayana Cheruvu Heronry	Chittoor	GH	Feb-April	Santharam & Rangaswamy 1999.
Bayi Cheruvu Heronry	Chittoor	NH	Feb-April	Santharam & Rangaswamy 1999.
Pedda Tippa Samudram Heronry	Chittoor	GC.IS, LC.OD, LE.SE.B HI, WSB	Feb-April	Santharam & Rangaswamy 1999.

[1] See text for expansion of abbreviations.
[2] Names refer to information obtained through personal communication.
[3] NK = Not known.

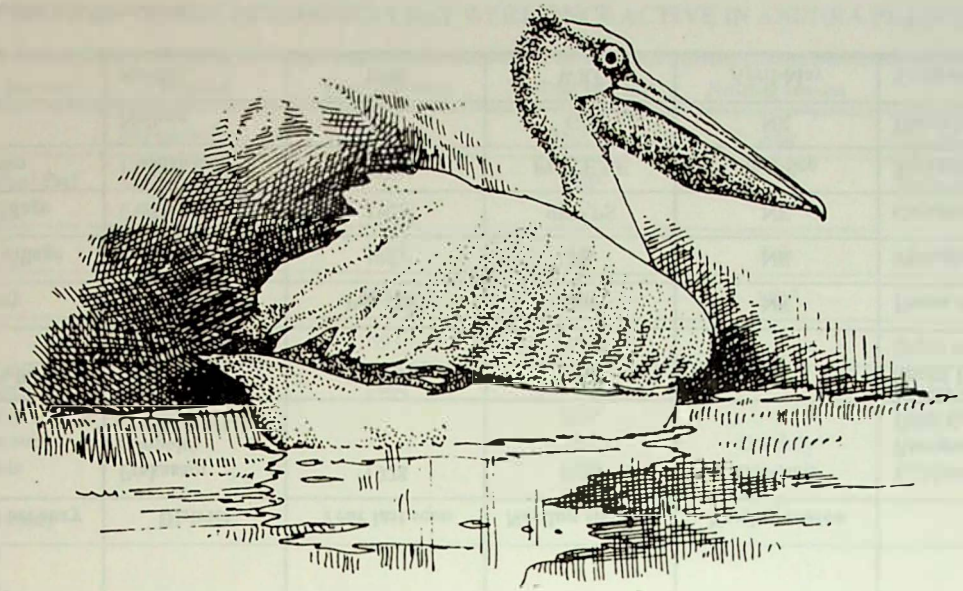
APPENDIX II
DETAILS OF THE HERONRIES THAT WERE ONCE ACTIVE IN ANDHRA PRADESH

Name of the heronry	District	Year last seen	Nesting species[1]	Nesting season	Source[2]
Navipet	Nizamabad	1914	PH,GE	Aug	Col. Sparrow: Ali, 1934.
Nehru Zoological Park Aviary	Rangareddi	???	SBP		Aasheesh Pittie.
Parkal	Warangal	1847	GH	Feb	Ali, 1934, Burton, 1885.
Burgess	? Godavari	1855?	PS	NK[3]	Hume and Oates 1890.
Kolair	West Godavari	???	WSB		Baker and Inglis, 1930?
Kolleru Pelicanries: Aredu Pelicanry Sarapalle Pelicanry Chilakalampada Pelicanry Kolamaru Pelicanry Ganapavaram Pelicanry	West Godavari	1964	 SBP SBP SBP SBP	Oct-July	Neelakantan, 1949; Gee,1960; Lamba,1963; Guttikar, 1978; Nagulu 1993.

Gunaparam (Gunnavaram) Pelicanry	East Godavari	1882	SBP	Dec	BMNH egg collection.
Name of the heronry	**District**	**Year last seen**	**Nesting species[1]**	**Nesting season**	**Source[2]**
Jarugumulli	Prakasam (Ongole)	1978	OBS	Dec-June	K. Mrutyumjaya Rao, K. Ramana Kumar & K. Dilip Kumar.
Pulla Goora Pully Pelicanry	Prakasam (Ongole)	Pre-1865	SBP	NK	Shortt 1865, Hume, 1881.
Shortt Pelicanry	Nellore	Pre-1865	SBP	NK	Hume, 1881.
Venkatapura Village	Anantapur	1959	PS	NK	Bhat *et al*, 1992.
Buchupalle Village	Cuddapah	1902	SBP,PS	NK	Campbell, 1902.
Cuddapah Town	Cuddapah	1987	PH,CE,LE	June-Sep	Riyazuddin.
Eluru	Nellore	??	GH	NK	Divya Muddappa.
Kirkpatrick	Nellore	1960	WRE	April-May	Kirkpatrick, 1961.

[1] See text for expansion of abbreviations.

[2] Names refer to information obtained through personal communication.
[3] NK = Not known.



ANNEXURE

List of contributors to the Andhra Pradesh heronry survey

Aasheesh Pittie, 8-2-545 Road No. 7, Banjara Hills, Hyderabad 500 034. Andhra Pradesh.

Ashok Kumar, S., Plot No. 491, Road No. 10, Jubilee Hills, Hyderabad 500033. Andhra Pradesh.

B.C. Choudhury, Wildlife Institute of India, P.B. No. 18, Dehradun 248001, Uttar Pradesh.

Bivash Pandav, Wildlife Institute of India, P.B. No. 18, Dehradun 248001, Uttar Pradesh.

Christian Perennou, Tour du Valat, Station Biologique, Le Sambuck, 13200, Arles, France.

Dilip Kumar, *Care for Natures Creatures*, 10-3-142, Panja Street, Bapatla 522 101, Guntur District. Andhra Pradesh.

Divya Muddappa, 8/364, Co-operative Colony, Valparai 642127, Tamil Nadu.

Joel Prashanth, J., Department of Zoology, Osmania University, Hyderabad 500 007, Andhra Pradesh.

Koteshwara Rao, Head Master, Zilla Parishad High School, Uppalapadu, Pedakakani Mandal, Guntur, Andhra Pradesh.

Kumar, M.M.L., Chief Inspector, Zonal Inspectorate, Zonal Office, Andhra Bank, S.V. University Campus, Tirupathi 517 502. Andhra Pradesh.

Mohamed Jafer Palot, Zoological Survey of India, Ashok Nagar, Hyderabad 500 020, Andhra Pradesh.

Mrutyumjaya Rao, K., *Care for Natures Creatures*, 10-3-142, Panja Street, Bapatla 522 101, Guntur District. Andhra Pradesh.

Nagulu, V., Department of Zoology, Osmania University, Hyderabad 500 007, Andhra Pradesh.

Narendra Prasad, S., Sálim Ali Centre for Ornithology and Natural History, Anaikatty P.O., Coimbatore 641000, Tamil Nadu.

Prakash Rao, WWF-India, 172-B, Lodi Estate, New Delhi 110 003.

Ramana Kumar, K., *Care for Natures Creatures*, 10-3-142, Panja Street, Bapatla 522 101, Guntur District. Andhra Pradesh.

Reddy, S.P., *Care for Natures Creatures*, 10-3-142, Panja Street, Bapatla 522 101, Guntur District. Andhra Pradesh.

Riyazuddin, S., 15/296, Bandla Mitta Street, Cuddapah 516 001, Andhra Pradesh.

Santharam, V., 68, I[st] Floor, Santhome High Road, Chennai 600 025, Tamil Nadu.

Siraj A. Taher, 2/B, Atlas Apartments, Road No. 10, Banjara Hills, Hyderabad 500 034, Andhra Pradesh.

Srinivasa, K., *Care for Natures Creatures*, 10-3-142, Panja Street, Bapatla 522 101, Guntur District. Andhra Pradesh.

Vasudeva Rao, V., Department of Zoology, Osmania University, Hyderabad 500 007, Andhra Pradesh.

LIST OF FIGURES

Figure 1. Distribution of heronries in Andhra Pradesh. Bold dots represent existing sites and open dots indicate lost sites.

Figure 2. Number of nesting sites of different species in Andhra Pradesh.

Figure 3. Distribution of major wetlands in Andhra Pradesh.

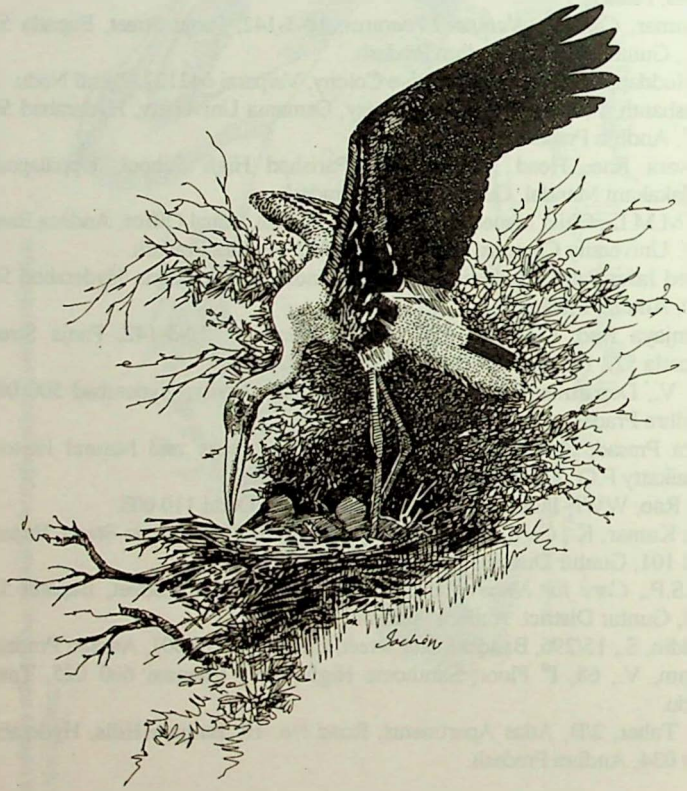


FIGURE 1

DISTRIBUTION OF HERONRIES IN ANDHRA PRADESH
(Bold dots represent existing sites and open dots indicate lost sites.)

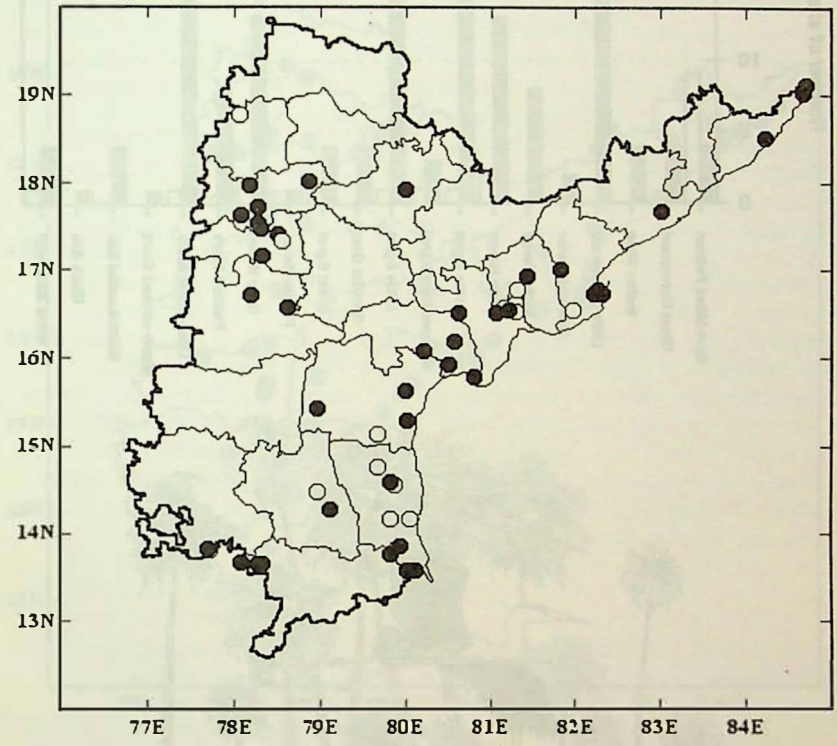


FIGURE 2

NUMBER OF NESTING SITES OF DIFFERENT SPECIES IN ANDHRA PRADESH

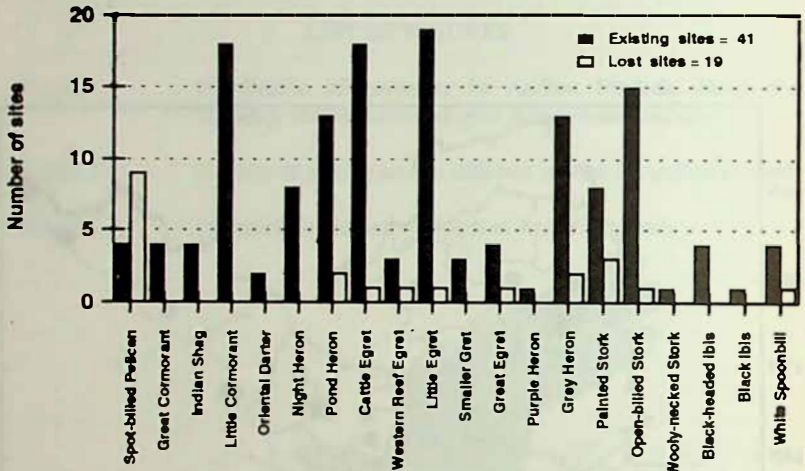
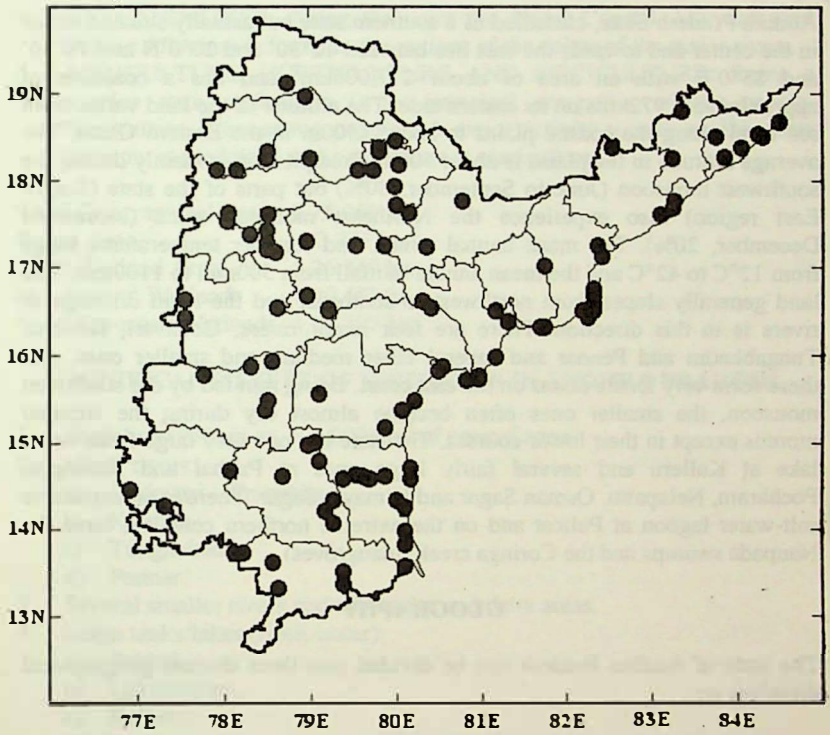


FIGURE 3

DISTRIBUTION OF MAJOR WETLANDS IN ANDHRA PRADESH



WETLANDS OF ANDHRA PRADESH, INDIA— STATUS AND PRESSURES[1]

SIRAJ A. TAHER & GHULAM MOHAMMAD TAHER[2]

INTRODUCTION

Andhra Pradesh State, classified as a southern state but actually situated rather in the center and towards the east lies between 12°30' and 20°0'N and 76°30' and 85°0'E with an area of about 277,000km^2 and has a coastline of approximately 972kms on its eastern side. The altitude of the land varies from sea level along the coastal plains to about 1500m in the Eastern Ghats. The average altitude in the plains is about 500m. Precipitation is mainly during the southwest monsoon (June to September, 80%) but parts of the state (South-East region) also experience the Northeast monsoon rains (November December, 20%). The mean annual winter and summer temperatures range from 12°C to 42°C and the mean annual rainfall from 500mm to 1100mm. The land generally slopes from northwest to southeast and the main drainage of rivers is in this direction. There are four major rivers, Godavari, Krishna, Tungabhadra and Pennar and several other medium and smaller ones, and these form very fertile deltas on the east coast. Being rain fed by the southwest monsoon, the smaller ones often become almost dry during the summer months except in their lower courses. The state has one very large fresh water lake at Kolleru and several fairly large ones at Pakhal and 'Ramappa, Pocharam, Nelapattu, Osman Sagar and Himayat Sagar. There is an expansive salt-water lagoon at Pulicat and on the extreme northern coast we have the Naupada swamps and the Coringa creek (mangroves).

GEOGRAPHY

The state of Andhra Pradesh can be divided into three distinct geographical divisions *viz.*,

1. EASTERN COASTAL PLAINS: More than half the coastal plain is covered by the Godavari, Krishna and Pennar river basins. Besides these, there is the large lagoon of Pulicat on the southeastern tip of the state.

[1] Received for publication: January 1992.
[2] *Address for communication*:
2-B, Atlas Apartment, Road # 10, Banjara Hills, Hyderabad 500034, India.

2. DECCAN PLATEAU: The plateau slopes from west to east and three of the smaller but important rivers in the plains, besides the Godavari and Krishna, are the Penganga-Pranahita, Manjira and Musi.
3. EASTERN GHAT RANGES: The Eastern Ghats run almost parallel to the coast and are broken by a number of rivers which flow through the long and wide valleys between different ranges having an average height of 450m.
4. WETLAND SOILS: Along the coast are found Coastal Alluvium and Deltaic Alluvium is found in the regions of the deltas of the major rivers.
5. AGRICULTURE, HORTICULTURE AND PISCICULTURE: Being a riverine state, agriculture is the principal occupation of the people. Horticulture is becoming popular. A major activity mostly on the coast and now in the inland tanks and farms is pisciculture.

Total Geographical Area 2,75,069 km^2.
Forest Area 63,771 km^2.
Total Wetland Area 5,26,349 ha.
a) Natural Wetlands 1,00,457 ha.
b) Man-made Wetlands 4,25,892 ha.

SIGNIFICANT TYPES OF WETLANDS IN ANDHRA PRADESH

1. Shoreline (972km or, *c.* 2,000 km^2 of coastal zone).
2. Major rivers:
   a) Godavari—Pranahita.
   b) Krishna.
   c) Tungabhadra.
   d) Pennar.
3. Several smaller rivers and tributaries and delta areas.
4. Large tanks/lakes (fresh water):
   a) Pakhal.
   b) Laknavaram.
   c) Kolleru.
   d) Ramappa.
   e) Osman Sagar.
   f) Himayat Sagar.
   g) Hussain Sagar.
5. Pulicat lagoon.
6. Coringa mangroves.
7. Naupada Swamps.
8. Krishna mangroves.

9. Godavari mangroves.
10. Reservoirs.

Innumerable smaller tanks, marshes, mangroves in several districts.

IMPORTANT WATERBIRD BREEDING AREAS

1. Nelapattu – Nellore district – Grey Pelicans, Cormorants, Night Herons
2. Punyakshetram _ East Godavari Dist. – Openbill Storks
3. Timmavacheruvu – Anantapur district – Openbill & Painted Storks
4. Telineelapuram – Srikakulam district – Openbill Storks
5. Telikunchi – Srikakulam district – Openbill Storks
6. Manjira river (& at Singur) – Medak district – Painted Storks Ibises, River Terns

PRINCIPAL WETLANDS OF ANDHRA PRADESH

1. KOLLERU LAKE
   Location: 16°30'—16°45'N, 81°05'—81°20'E; in Krishna and West Godavari districts, 50 km. from Vijayawada to the east, A.P.
   Area: 90,000ha at maximum flooding.
   Ecological category: Fresh water.

2. THE KRISHNA MANGROVES
   Location: 15°42'—15°48'N, 80°50'—81°0'E; 90km. SSE of Vijayawada and 50km. South-West of Machilipatnam.
   Area: *c.* 20,000ha.
   Ecological category: Brackish water.

3. PAKHAL LAKE
   Location: 17°57'N, 80°0'E in Warangal district, 40km east of Warangal, A.P.
   Area: *c.* 1,500ha.
   Ecological category: Fresh Water.

4. MANJIRA BARRAGE AND SINGUR
   Location: 17°38' N, 78°05'E; 50km. northwest of Hyderabad, A.P.
   Area: 2,000ha.
   Ecological category: Fresh Water.

5. POCHARAM RESERVOIR

Location: 18°08'N, 77°57'E; on the Manjira river 85km. North-West of Hyderabad, A.P.
Area: 20,000ha.
Ecological category: Fresh water.

6. NELAPATTU TANK
Location: 13°50'N, 79°59'E; 68km. South of Nellore, A.P.
Area: Tank of 160ha in a sanctuary of 450ha.
Ecological category: Fresh water.

7. PULICAT LAGOON
Location: 13°55'N, 80°03'—80°19'E; 45km. north of Madras, Tamil Nadu and Andhra Pradesh.
Area: *c*. 72,000ha including *c*. 20,000ha of swamps to the north of the lake. 46,100ha of the lake are in A.P. and the remaining 6,000ha are in Tamil Nadu.
Ecological category: Brackish water (a small area is fresh water and marsh).

8. CORINGA MANGROVES
Location: 16°59'N, 82°22'E; in the Godavari delta, 70 km. South-East of Rajahmundry, A.P.
Area: 23,570ha.
Ecological category: Brackish water.

9. GODAVARI MANGROVES
Location: 16°23'N, 82°20'E; in the East Godavari district near Kakinada.
Area: 6,000ha.
Ecological category: Brackish water.

PROBLEMS

1. CORINGA MANGROVES
- Destruction of mangroves forests due to heavy biotic pressure.
- Conversion of mangroves forests for different land uses.
- Dwindling of fisheries resources.
- Pollution due to discharge of effluents.

2. GODAVARI MANGROVES
- Conversion of mangrove areas for agricultural activities.
- Exploitation of mangroves due to heavy human pressures.

- Human activities like clear felling, diversion of fresh water near shore, mining.
- Oil and industrial pollution.

3. KOLLERU LAKE
- Inflow of effluents from industries and habitation around the lake.
- Conversion of lake for land use practice.
- Mushroom growth of fisheries tanks, which interfere with the natural circulation of water.
- Infestation of lake area by water hyacinth.
- Siltation due to denuded catchment areas.

4. KRISHNA MANGROVES
- Destruction of mangrove forests due to indiscriminate resource uses.
- Over exploitation of fisheries resources.
- Inflow of industrial effluents.
- Discharge of agricultural pesticides and insecticides.

WETLAND WILDLIFE SANCTUARIES (Area in km^2)

EXISTING		**PROPOSED**	
1. Pakhal	878	1. Naupada	20
2. Pranahita	136	2. Nachugunta Kottavelam	50
3. Pocharam	130		
4. Manjira	20		
5. Kolleru	673		
6. Nellapattu	236		
7. Nellapattu	15 (tank only)		
8. Pulicat	600		
TOTAL	2,688	TOTAL	70

TOTAL = 2,758

ASIAN WATERFOWL CENSUS FIGURES

SITES	1987	1988	1989	1990	1991
India	189	326	650	655	816
Andhra Pradesh	12	32	103	107	94

PARTICIPANTS					
India	121	180	282	318	300
Andhra Pradesh	17	26	32	35	31
WATER FOWL COUNTS					
India	373,454	427,580	1,560,000	1,580,000	1,755,545
Species	(102)	(148)	(142)	(152)	(155)
Andhra Pradesh	21,675	37,978	277,463	72,474	92,621

STATUS OF WETLANDS AND MANGROVES IN ANDHRA PRADESH

WETLANDS

There are two major wetlands in the state, which are identified as of international importance under Ramsar convention. These are: (1) Pulicat lake extending over 600sq.km. in the southern most tip of the state in Nellore district and partly extending into the adjoining Tamil Nadu state and an area of about 250sq.km. The entire lake has already been declared as a wildlife sanctuary both in A.P. and Tamil Nadu in 1981. This is a salt-water lake formed due to a natural geological depression on the shores of the Bay of Bengal and draws water from the sea during high tide. This is a shallow lagoon and does not exceed over 2m. in depth at the deepest point of the lake.

The second largest lake identified is the Kolleru Lake extending over an area of about 950sq.km. at full flood level located in the districts of West Godavari and Krishna and the entire lake was already declared as a wildlife sanctuary in 1962.

Considering their importance, both the lakes have been identified as wildlife sanctuaries to protect the migratory birds and local birds that inhabit these lakes as a part of obligation as India is a signatory both for the Ramsar convention and also bilateral convention with Russia for protection of migratory birds.

AREA COVERED BY WETLANDS IN THE STATE

Five lakh and fifty thousand hectares of wetlands in A.P.
1/3= village tanks; 1/3=major and minor irrigation reservoirs
1/3= balance lakes, lagoons, river systems.

MANGROVES

Mangroves occur in A.P. in the estuaries of Godavari and Krishna rivers. In total 582.19km^2 are found in both these estuaries. Out of this 429.70km^2 are brought under the network of the protected areas by notifying Godavari estuary as Coringa wildlife sanctuary extending over in area of 235.70km^2 and Krishna estuary as Krishna wildlife sanctuary extending over an area of 194km^2.

Mangroves provide different ecological niches for a variety of animal populations. The tree canopy offers excellent habitat for birds while the surface provides a niche for several insects, animals and fish, which can only survive in such eco-systems. The mangroves of A.P. support such endangered species as dugongs, dolphins, otters, fishing-cats, *etc*.

ACTION PLAN FOR CONSERVING MANGROVES

1. To bring all the mangroves under the protected areas network and this was already done by bringing the major chunks of mangroves under wildlife sanctuaries.
2. Consolidation of mangroves by clear demarcation and erection of Cairns to avoid encroachments.
3. Eco-development plans for reducing human pressure for their energy requirements and grazing by their cattle.
4. Reforestation of degraded areas.

RIVERS, MARSHES, SWAMPS & RESERVOIRS

Five important and large rivers flow through the state from the West to the East, forming extensive and fertile deltas on the East Coast before they join the Bay of Bengal. All these rivers and the several other smaller tributaries form very important wetland habitats, especially when flowing through the plains and at the deltas.

Of late various developmental and population pressures are resulting in changes detrimental to the river systems as well as the flora and fauna they support. The frequent floods, droughts, erosion and siltation in the rivers and reservoirs have caused immense damage both financial and environmental. The extensive deforestation in the upper reaches of the rivers becomes evident in the deplorable conditions downstream. Besides the heavy utilization of the deltas and low banks of the rivers for agricultural purposes further deteriorates the system.

MARSHES AND SWAMPS

Marshes, which form an almost complete though small self-supporting ecosystem are under heavy pressure and are extensively being reclaimed. Several such very important areas have disappeared over a period of time. There is only one true swamp at Naupada in the extreme north of the State. It is a small (20km^2.) brackish swamp community supporting migratory and resident waterfowl.

Such small but significant marshes and swamps are to be still found all over the state but are under a constant threat of extinction.

RESERVOIRS

Though considered man-made culprits, detrimental to the ecology of the area, they may really be useful if carefully planned and managed. After careful selection of site and proper management both from an engineering, as well as an ecological point of view, they could provide the required natural resources on a sustainable basis.

An attempt must also be made to balance its utilitarian value with the nature conservation scheme in the man-modified eco-system.

There are several such reservoirs in Andhra Pradesh, which have become refuges, feeding and breeding grounds for the migratory and resident waterfowl and other species of birds, which find support here.

Observations have shown that population trends for different avifauna are related to:

1) Changes in the habitat and availability of favoured niches.
2) Availability and accessibility of specific food sources.
3) Presence of secluded nesting and roosting sites.
4) Extent of disturbance by human activity.

TANK IRRIGATION

Tank irrigation, formerly a source of relative stability, has become a source of instability for agricultural production in many parts of India. Important factors for the decline in tank irrigation are: environmental degradation such as deforestation, soil erosion, siltation, tank bed cultivation, and lack of administrative setup to provide timely repair and maintenance of tanks and to ensure proper water control and tank management. Unauthorised cultivation, tank-bed cultivation and foreshore encroachments.

Tank irrigation, especially in southern India, is very closely interwoven with settlement pattern and village organization. Nevertheless, in many parts of the country, especially in areas of high population densities, irrigation tanks are in decay and the areas irrigated by tanks is declining.

There are three reasons for this decline in tank irrigation.

1. The human pressure on land transforms the environment and affects the performance of irrigation tanks; vegetation in the catchment areas decreases because of over-utilization. Subsequent erosion and flash run-offs cause siltation of the tank beds and breaches of tanks.
2. Alternative sources of irrigation water have been developed, especially well water lifted by mechanical devices. Public as well as private investments tend to favour these options over the traditional tank irrigation schemes.
3. The administration of irrigation tanks is neglected, leading to increasingly inefficient water use, which in turn accelerates the redirection of private investments. Irrigation tanks are increasingly being treated as common property resources, exploited without proper management, and degraded.

ECOLOGICAL IMPORTANCE OF TANKS

The ecological importance of tanks is wide-ranging and multifarious, even extending to the domain of the local socio-economic situation.

Tanks also have a tremendous hydrological role to play. Because they serve as checks against seasonal (monsoon) rapid water flows in valleys, they automatically act as checks against minor floods and more important, drought conditions during dry months. A part from helping to store large quantities of surface water, they help to recharge ground water. This in turn would help to maintain water yields of the well and tube wells closed by.

These tanks possess both deep water zones and shallow water zones of varying extent, and this imparts a unique ecological significance; a) Deep water zones serve to support ducks, b) the shallow water zones and association mudflats and soft and banks support waders, herons and other marshland waterfowl.

The bird life supported by such tanks further plays an important role in providing raw materials in the form of major nutrients especially nitrogen, potassium, phosphates and other inorganic salts (minor but essential nutrients) directly into the tank water through their droppings. These help to make the tank water fertile and initiate the food chain from the plankton levels. This eventually makes the water body highly productive in overall terms. Since a

major part of this water is used for irrigation in the rural areas the already fertile waters would be able to support a higher crop quality.

THREATS AND DISTURBANCES

Wetlands are more vulnerable to accidental and intentional human interference than any other habitat. This is because both water levels and quality can very easily be altered to spoil the life support system of the wetland. Excessive water inflow or outflow eutrophication through sewage or washed down (leached) fertilizers industrial effluents or toxic substances with or without synergistic effects, etc. can all impose very severe constraints on wetlands as wildlife habitats. When it becomes unsuitable to wildlife, it is but natural that it becomes unsuitable as wetlands to man also in course of time. This may be directly or though processes like biological amplification. It thus becomes very imperative that we take up the case of the wetlands seriously and in earnest.

MUD-LIFTING

The Problem
The tank bed silt/mud has been traditionally used as manure and for local constructional purposes on a small scale. With the growth of cities, mud lifting has reached enormous commercial proportions, with the mud being used for making bricks on an industrial scale.

The Effects
Indiscriminate mud lifting from the tank bed severely affects the tank ecosystem.

ENCROACHMENT ON TANK BEDS

The Problem
Reclamation of the tank beds for uses detrimental to the well being of the tank can be termed encroachments. A part from mud lifting and brick making activities, encroachments are basically for the purposes of agriculture human settlements (housing and slums), and road building.

The Effects
Encroachments not only affect the tank directly but also bring other disturbances.

POACHING AND HUNTING OF BIRDS

Waterfowl, especially the migratory species that are present in our region from about October to April are extensively hunted in our tanks. Clap traps and other such like devices and guns are made use of for the purpose. The claptraps are made using bamboo frames and fish nets. Guns used are of all kinds, from rifles to muzzle loaders using gunpowder. Actual recorded hunting and that revealed by local enquiries indicate that it is present in about 35% of the tanks. This could even be a very conservative estimate.

Hunting of any kind needs to be stopped. The costs involved in hunting per unit weight of food would be much greater than perhaps rearing domestic fowl. Existing laws for the preservation of wild life, which include waterfowl, should be given more publicity. On a large scale even the media could be used for the purpose.

SEWAGE AND EFFLUENTS

Sewage alters the status of the wetland. Other effluents an have other harmful effects depending on their nature of the effluents.

CREATION OF BIRD REFUGES

Irrigation tanks can be made more attractive to birds by providing suitable nesting, feeding and resting sites. Small islands can be created in the tanks, close to the deep-water area for birds to rest, nest and feed. Planting them with suitable trees would provide nesting and roosting sites for egrets, herons, cormorants and such other water birds. These islands should be planted with species that can withstand water stagnation. The species should be such that they grow to different heights.

The vacant land around the tanks above the high water mark should be developed into a wooded area with abundant shrub cover. This may attract a number of passerine and non-passerine birds.

RECOMMENDATIONS

1. There should be open and closed seasons for mud lifting. Mud lifting should compulsorily be restricted to the dry months.
2. The proportions of the tanks suitable for mud lifting should be identified and then demarcated into five or six equal size plots by permanent flagstones. Mud lifting should be allowed on a sequential rotational basis of one plot per year.

3. All practices should be strictly adhered to, to allow the flora and fauna of the tank to survive and grow, and at the same time allow the tank ecosystem to recuperate through limited successional processes.
4. Encroachments need to be removed and adequate and immediate protection to the tank ensured.
5. The quality of the water flowing in should be improved and bettered. BOD and suspended solids need to be brought to within acceptable limits. Appropriate technologies and practices need to be employed for the purpose. Inflow of untreated effluents needs to be completely stopped.
6. Developing a proper land-use pattern for the peripheral areas of the lake based on aerial photographic surveys and demarcating areas for afforestation, fruit gardens, agriculture pisciculture, providing feeding and nesting areas to the birds and development of tourism etc.,
7. A buffer zone to be developed with extensive forestry programmes by raising an effective shelter belt which not only becomes a disturbance free zone but also a true buffer in eliminating pollution and human disturbances for a peaceful existence of the birds in the lake.
8. Population control is to be given high priority, agricultural residual discharges, fishpond discharges, industrial and domestic wastes have to be controlled and treated.
9. To achieve the above objectives, it is necessary to bring the whole gambit of development of the lake under one authority.

KOLLERU LAKE

The Kolleru Lake is a large wetland, which is formed due to natural depression in the districts of West Godavari and Krishna. The Lake gets filled up with fresh water from various drains and streams. The full flood level of the lake is +10.7msl. The actual area of the lake fluctuates according to the inflow of water in various seasons The Lake gets filled up in high flood season at +10.7 MSL spreading over an area of 950km^2. In summer, the water level goes down to almost +2msl and spreads over an area of 66.56km^2.

PROBLEMS

1. Rapid siltation of lake with consequent loss of flood absorption capacity and flooding of catchment areas upto +10 contour.
2. Depleting the water in the lake to a + 3 / +2 contour in dry season resulting in:
   i) shrinkage of lake area,

ii) Encroachment of lake bed by people, extending agricultural operations upto +2 contour, and
iii) Inadequacy of water for aquaculture.

3. The desertion of the lake by Pelicans and a great loss of bird life in the lake seriously affecting the viability of the lake as a bird sanctuary.
4. Eutrophication of the lake resulting in extensive weed growth effecting the fauna and flora in the lake and causing ecological imbalance.
5. High Pollution pressure in the lake area, resulting in excessive ecological demand on the lake and its environs, by way of agriculture and fish production and disturbance of the eco-system of the lake by encroachment and tank-bunds formation and roads laying, tree cutting operations and consequent destruction of wildlife.

SUGGESTIONS

1. The corrective action lies in ensuring that the lake is not bled dry in summer, but a minimum water level at about +5 is maintained by constructing a suitable regulator on the outlet system.
2. Several islands inside the lake are to be afforested for the exclusive use of nesting and roosting by the birds by developing these islands with proper tree cover.
3. Shifting of the lakebed villages, upto +5 contour.
4. Construction of roads across the lake to the link villages is to be stopped.
5. De-weeding of the lake is to be on a war footing and periodical removal of weeds is to be done to provide enough space for proper growth of marine fauna, and to avoid eutorphication.
6. All developmental activities are to be planned so as to be in harmony with the ecological balance of the system.

PULICAT

1. Pulicat Lake is comparatively a better-preserved wetland. However, this lake has several problems due to pressure by the people. Four major islands exist inside the lake and the people living therein have absolute ownership of the lands in the islands and they practice agriculture on these lands.

PROBLEMS

1. The people living in the islands of the lake wanted roads to be laid cutting across the lake bed and dividing the lake into smaller segments thereby

the very flow of water from the sea will be restricted—eventually most of the lake bed will be drained off.

2. The people living in the islands have been pressurizing the Government for connecting the island villages with power supply by laying high-tension cables.
3. Another major problem faced by this wetland is for the demand of quarrying of the lakebed for time limeshell industry and brine industry by the industrial lobby.

SUGGESTIONS

1. Shifting of the four major island villages from the lake bed to the periphery and giving them equal land for their agriculture.
2. Total ban on creation of any industry in or around the lake to a distance of 10 Km. which will use the lake or its bed as a resource.
3. Total ban on construction of bunds, roads and electricity lines through the lake.
4. Protecting the lake as a wetland for the benefit of migratory birds, which visit this area.

WETLAND BIRDS AND WATERFOWL OF ANDHRA PRADESH

GREBES
Great Crested Grebe *Podiceps cristatus*
Little Grebe *Podiceps ruficollis*

TROPICBIRDS
Longtailed Tropic Bird *Phaethon lepturus*

PELICANS
Spotted-billed Pelicam *Pelicanus philippensis*

CORMORANTS
Large Cormorant *Phalacrocorax carbo*
Indian Shag *Phalacrocorax fuscicollis*
Little Cormorant *Phalacrocorax niger*
Darter *Anhinga rufa*

HERONS, EGRETS, BITTERNS
Grey Heron *Ardea cinerea*
Eastern Purple Heron *Ardea purpurea*
Eastern Large Egret *Ardea alba*
Little Green Heron *Butorides striatus*
Pond Heron *Ardeola grayii*
Cattle Egret *Bubulcus ibis*
Median Egret *Egretta intermedia*
Little Egret *Egretta garzetta*
Indian Reef Heron *Egretta gularis*
Night Heron *Nycticorax nycticorax*
Chestnut Bittern *Ixobrychus cinnamomeus*
Black Bittern *Ixobrychus flavicollis*
Bittern *Botaurus stellaris*

STORKS
Painted Stork *Mycteria leucocephala*
Openbill Stork *Anastomus oscitans*
Whitenecked Stork *Ciconia episcopus*
White Stork *Ciconia ciconia*
Black Stork *Ciconia nigra*
Blacknecked Stork
Ephippiorhynchus asiaticus
Lesser Adjutant *Leptoptilos javanicus*

IBISES, SPOONBILLS
White Ibis *Threskiornis aethiopica*
Black Ibis *Pseudibis papillosa*
Glossy Ibis *Plegadis falcinellus*
Spoonbill *Platalea leucorodia*

FLAMINGOS

Flamingo *Phoenicopterus roseus*
Lesser Flamingo *Phoenicomaias minor*

DUCKS, GEESE
Barheaded Goose *Anser indicus*
Lesser Whistling Teal *Dendrocygna javanica*
Large Whistling Teal *Dendrocygna bicolor*
Brahminy Duck *Tadorna ferruginea*
Common Shelduck *Tadorna tadorna*
Pintail *Anas acuta*
Common Teal *Anas crecca*
Spotbill Duck *Anas poecilorhyncha*
Gadwall *Anas strepera*
Wigeon *Anas penelope*
Garganey *Anas querquedula*
Shoveller *Anas clypeata*
Pink-headed Duck* *Rhodonessa caryophyllacea*
Redcrested Pochard *Netta rufina*
Common Pochard *Aythya ferina*
White-eyed Pochard *Aythya nyroca*
Tufted Duck *Aythya fuligula*
Cotton Teal *Nettapus coromandelianus*
Comb Duck *Sarkidiornis melanotos*

CRANES
Eastern Common Crane *Grus grus*
Indian Sarus Crane *Grus antigone*
Demoiselle Crane *Anthropoides virgo*

RAILS, COOTS
Blue-breasted Banded Rail *Rallus striatus*
Baillon's Crake *Porzana pusilla*
Ruddy Crake *Porzana fusca*
Brown Crake *Amaurornis akool*
White-breasted Waterhen *Amaurornis phoenicurus*
Watercock *Gallicrex cinerea*
Indian Moorhen *Gallinula chloropus*
Purple Moorhen *Porphyrio porphyrio*
Coot *Fulica atra*

JACANAS
Pheasant-tailed Jacana *Hydrophasianus chirurgus*
Bronzewinged Jacana *Metopidius indicus*

PLOVERS, SANDPIPERS, SNIPE
Sociable Lapwing *Vanellus gregarious*
Redwattled Lapwing *Vanellus indicus*
Spurwinged Plover *Vanellus spinosus*
Yellow-wattled Lapwing *Vanellus malabaricus*
Grey Plover *Pluvialis squatarola*
Eastern Golden Plover *Pluvialis dominica*
Australian Blackfronted Plover *Charadrius melanops*
Little Ringed Plover *Charadrius dubius*
Kentish Plover *Charadrius alexandrinus*
Pamir Lesser Sand Plover *Charadrius mongolus*
Whimbrel *Numenius phaeopus*
Curlew *Numenius arquata*
Black-tailed Godwit *Limosa limosa*
Spotted Redshank *Tringa erythropus*
Common Redshank *Tringa totanus*
March Sandpiper *Tringa stagnatilis*
Greenshank *Tringa nebularia*
Green Sandpiper *Tringa ochropus*
Spotted Sandpiper *Tringa glareola*
Terek Sandpiper *Tringa terek*
Common Sandpiper *Tringa hypoleucos*
Turnstone *Arenaria interpres*
Wood Snipe *Gallinago nemoricola*
Pintail Snipe *Gallinago stenura*
Fantail Snipe *Gallinago gallinago*
Jack Snipe *Gallinago minima*
Woodcock *Scolopax rusticola*
Sanderling *Calidris alba*
Little Stint *Calidris minuta*
Temminck's Stint *Calidris temminckii*
Dunlin *Calidris alpina*
Curlew-Sandpiper *Calidris testacea*
Ruff *Philomachus pugnax*
Ringed Plover *Charadrius hiaticula*
Eastern Knot *Calidris tenuirostris*
Red-necked Phalarope *Phalaropus lobatus*
Painted Snipe *Rostratula benghalensis*

STILTS, AVOCETS
Indian Blackwinged Stilt *Himantopus himantopus*
Avocet *Recurvirostris avosetta*

CRAB-PLOVERS
Crab Plover *Dromas ardeola*

PRATINCOLES
Large Indian Pratincole *Glareola pratincola*
Small Indian Pratincole *Glareola lactea*

GULLS, TERNS

Herring Gull *Larus argentatus*
Great Blackheaded Gull *Larus ichthyaetus*
Brownheaded Gull *Larus brunnicephalus*
Blackheaded Gull *Larus ridibundus*
Slender billed Gull *Larus genei*
Indian Whiskered Tern *Chlidonias hybrida*
Gullbilled Tern *Gelochelidon nilotica*
Caspian Tern *Hydroprogne caspia*
Indian River Tern *Sterna aurantia*
Blackbellied Tern *Sterna acuticauda*
Little Tern *Sterna albifrons*
Indian Skimmer *Rynchops albicollis*
Common Tern *Sterna hirundo*
Lesser Blackbacked Gull *Larus fuscus*

*Probably extinct.

REFERENCES

1. A Directory of Asian Wetlands – IBCN.
2. Asian Waterfowl Census – Reports – 1987 to 1991, IWRB Slimbridge, U.K.
3. Notes on the status of 'Kolleru lake (1990) – A draft proposal Mr. T. Ramakrishna, IFS, Conservator of Forests, Andhra Pradesh Forest Department.
4. Rodgers and Panwar, H.S. – Planning a wildlife protected area network in India (1988) Vols. I & II – a report – Wildlife Institute of India Dehra Dun.
5. Status of Wetlands and Mangroves in Andhra Pradesh – A draft proposal – Mr. T. Ramakrishna, IFS, Conservator of Forests, Andhra Pradesh Forest Department.
6. Taher, S.A. & Pittie, A. (1989) – A checklist of Birds of Andhra Pradesh, Hyderabad.
7. Wetlands and Waterfowl – Reports, 1988 and 1990, BNHS, Bombay.
8. Wetlands of India – A directory, (1990) Government of India, Ministry of Environment and Forests, New Delhi.
9. Wetlands, Mangroves and Biosphere reserves proceedings of the Indo-US workshop, New Delhi (1989)--Government of India, Ministry of Environment and Forests.

SOME INTERESTING BIRD OBSERVATIONS AT GUDUR TANK, NELLORE DISTRICT, ANDHRA PRADESH[1]

SIRAJ A. TAHER[2]

On several occasions while traveling by train either to Nelapattu and Pulicat Bird Sanctuaries or to Madras (Tamil Nadu), I observed a fairly large tank near Gudur and just past the railway station. At the appropriate time, say between October/November or December/January, the water level in the tank looked quite good and sometimes large groups of waterbirds could be seen on this lake and occasionally, when the birds were closer to the railway tracks, they could be identified as ducks and coots and even one or two grebes. Of course, the egrets or lapwings were more identifiable. Gulls, Pariah Kites *Milvus migrans* and once even a Brahminy Kite *Haliastur indus* were also sighted. Now all these were brief observations from the train and nothing much could be noted but certainly this tank seemed an interesting place with much potential for birdwatching or counting birds. Since I was at that time involved with the Birdwatchers' Society of Andhra Pradesh in the Asian Midwinter Waterfowl Census, I thought it to be as good a place as any to undertake the census work—only if an opportunity and time could be found to visit the place at the right time. The first chance I got to stop at Gudur was in November 1990, too early for the census work, but certainly not for observing the migratory and other birds and to briefly study the area.

LOCATION, SURROUNDINGS AND HABITAT

On the northern side of the tank is Gudur town and a large and extensive scrub vegetation can be seen on the south. Even a small village is situated nearby. The Calcutta-Madras highway skirts the lake on the east and the Vijayawada-Madras railway track passes along the western banks. A canal flows under the tracks at one point and into the tank. At some distance are fields and scrub and also an industrial estate is situated nearby.

The main supply of water to the tank is during the northeast monsoons (November-December) and most of it comes through the feeder channel. Some run-off from the surrounding areas helps increase the water level. From about April till the end of August/September, the tank is mostly dried up and shrunk to a small area. Since the canal carries much water even from long distances,

[1] Received for publication: January 1992
[2] *Address for communication*:
2-B, Atlas Apartment, Road # 10, Banjara Hills, Hyderabad 500034, India.

the lake looks a reasonable-sized water body almost till the end of February/March when the migratory season for the birds comes to an end.

My next visit to the lake was during the last week of January 1991. The waters in the tank were full and the birdlife looked very good. About 2500+ ducks (9 species) besides the egrets, herons, storks, several species of waders, gulls and terns were seen and counted. Besides some other species dependant on the waterbody like the Brahminy Kite, Marsh Harriers *Circus aeruginosus*, swallows, swifts, wagtails and kingfishers could also be sighted. Others included mainly the dry scrubland birds like shrikes, doves, warblers, larks and bee-eaters. During the months of February/March, since most of the smaller tanks nearby dry-up and the Gudur Tank continues to hold good water, it seems to be an important refuge and resting grounds for quite sometime for the migratory birds before they leave for the northern latitudes. The scrub jungle is also a very important habitat for the dry land birds both migratory and the resident species and the nearby open fields provide an added attraction for their feeding.

Reportedly, poaching and trapping goes on in this areas mostly involving people from the villages but some times the town folks also join in this activity.

POTENTIAL, PROSPECTS AND PROPOSALS

The Gudur Tank with it's surrounding large scrubland and the fields seems to hold a great potential for the birds (both wetland and scrub forest species) with some improvements, protection and reasonable upkeep. Some suggestions are being made which could be considered for future action:

1. Planting suitable tree species in the tank and along the bund.
2. Dry land bushes and trees of suitable species are planted on the scrubland.
3. If possible, create some marshy areas in the tank by planting reeds, grasses and bulrushes to provide a cover for the waterbirds. Creation of a few mudflats at suitable places in the tank would also be helpful.
4. A watchtower may be put up at an appropriate location and a few telescopes and a couple of bird guides provided. This will greatly facilitate observation of ducks and other water birds, which are sometimes too far for binoculars.
5. A ranger could be posted at Gudur to oversee the tank and to prevent any disturbance to the existing habitat.

These steps will, in due course, provide excellent opportunity for the birds to nest and also for roosting, nesting material and food.

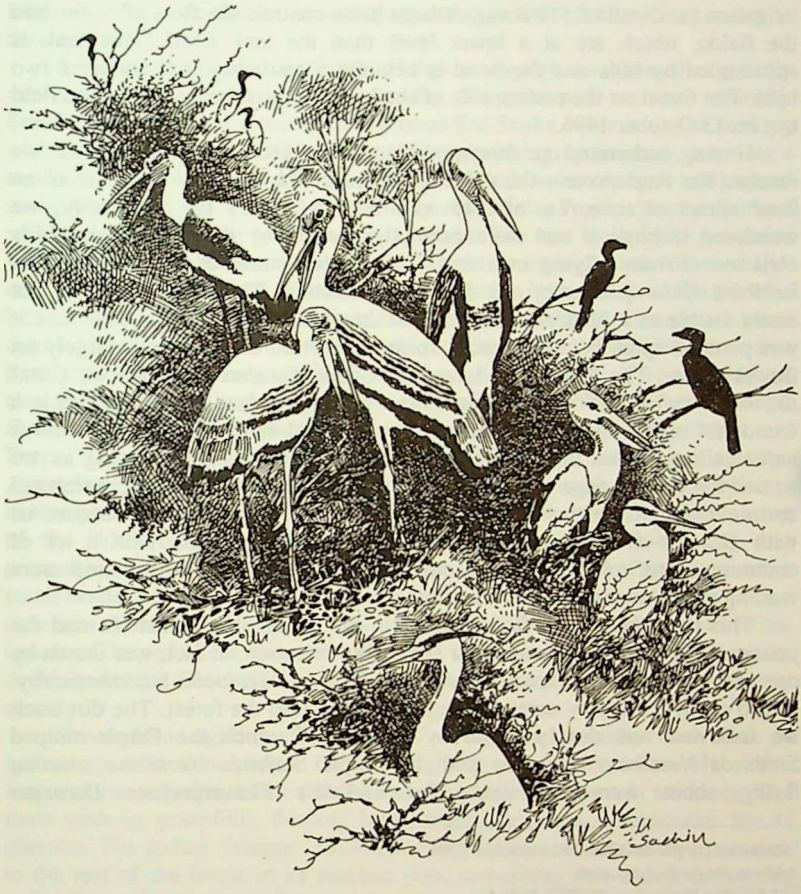
CONCLUSION

The planting of trees both in the tank, along the periphery and on the surrounding lands and creating or improving the habitat should be as per the procedures and practices of the wilderness areas development schemes. The A.P. Forest Department will be the most competent authority to undertake this work along with any other government/village agency controlling the tank. This could play an important role in the study of the habits and habitats of wetland and scrub forest birds, both migratory and resident.

ANNEXURE
CHECKLIST OF BIRDS SEEN AT GUDUR TANK AND SURROUNDS
(November 1990 and January 1991)

Little Grebe *Podiceps ruficollis*
Indian Shag *Phalacrocorax fuscicollis*
Little Cormorant *Phalacrocorax niger*
Grey Heron *Ardea cinerea*
Large Egret *Egretta alba*
Pond Heron *Ardeola grayii*
Cattle Egret *Bubulcus ibis*
Chestnut Bittern *Ixobrychus cinnamomeus*
Median Egret *Egretta intermedia*
Little Egret *Egretta garzetta*
Flamingo *Phoenicopterus roseus*
Openbill Stork *Anastomus oscitans*
Lesser Whistling Teal *Dendrocygna javanica*
Pintail *Anas acuta*
Spotbill Duck *Anas poecilorhyncha*
Wigeon *Anas penelope*
Garganey *Anas querquedula*
Redcrested Pochard *Netta rufina*
Common Pochard *Aythya ferina*
Tufted Pochard *Aythya fuligula*
Cotton Teal *Nettapus coromandelianus*
Pariah Kite *Milvus migrans*
Brahminy Kite *Haliastur indus*
Indian Shikra *Accipiter badius*
Marsh Harrier *Circus aeruginosus*
Kestrel *Falco tinnunculus*
Grey Partridge *Francolinus pondicerianus*
Bush Quail *Perdicula asiatica*
Coot *Fulica atra*
Pheasant-tailed Jacana
Hydrophasianus chirurgus
Redwattled Lapwing *Vanellus indicus*
Little Ringed Plover *Charadrius dubius*
Kentish Plover *Charadrius alexandrinus*
Greenshank *Tringa nebularia*
Spotted Sandpiper *Tringa glareola*
Common Sandpiper *Tringa hypoleucos*
Little Stint *Calidris minutus*
Temminck's Stint *Calidris temminckii*
Blackwinged Stilt *Himantopus himantopus*
Brownheaded Gull *Larus brunnicephalus*
Blackheaded Gull *Larus ridibundus*
Gullbilled Tern *Gelochelidon nilotica*
River Tern *Sterna aurantia*
Spotted Dove *Streptopelia chinensis*
Little Brown Dove *Streptopelia senegalensis*
Roseringed Parakeet *Psittacula krameri*
Pied Crested Cuckoo *Clamator jacobinus*
Hawk–Cuckoo *Cuculus varius*
Palm Swift *Cypsiurus parvus*
Pied Kingfisher *Ceryle rudis*
Small Blue Kingfisher *Alcedo atthis*
Whitebreasted Kingfisher *Halcyon smyrnensis*
Blue-tailed Bee-eater *Merops philippinus*
Small Green Bee-eater *Merops orientalis*
Indian Roller *Coracias benghalensis*
Redwinged Bush Lark *Mirafra erythroptera*
Ashycrowned Finch-Lark *Eremopterix grisea*
Small Indian Skylark *Alauda gulgula*
Eastern Swallow *Hirundo rustica*
Redrumped Swallow *Hirundo daurica*
Bayhacked Shrike *Lanius vittatus*
Brown Shrike *Lanius cristatus*
Golden Oriole *Oriolus oriolus*

Black Drongo *Dicrurus adsimilis*
Brahminy Myna *Sturnus pagodarum*
Indian Myna *Acridotheres tristis*
Jungle Crow *Corvus macrorhynchos*
Redvented Bulbul *Pycnonotus cafer*
Jungle Babbler *Turdoides striatus*
Streaked Fantail Warbler *Cisticola juncidis*
Indian Wren-Warbler *Prinia subflava*
Ashy Wren-Warbler *Prinia socialis*
Tailor Bird *Orthotomus sutorius*
Blyth's Reed Warbler
Acrocephalus dumetorum
Paddyfield Pipit *Anthus novaeseelandiae*
Yellow Wagtail *Motacilla flava*
Large Pied Wagtail *Motacilla maderaspatensis*



BIRDING AT NARSAPUR[1]

J.V.D. MOORTY[2] & VINAY TOTAWAR[3]

Approximately 50km from Secunderabad railway station on the national highway going North towards Medak, lies the village of Narsapur. The highway passes through hilly terrain and is densely wooded on both sides. Very close to the village, on the western side of the highway, is an irrigation tank—all of 510 acres. A large bund controls the flow of water into the fields, which are at a lower level than the tank itself. This tank is surrounded by hills and the bund is actually a causeway that connects two hills. The forest on the eastern side of the highway was the venue for the field trip on 13 October 1996.

Having underrated our driving skills and overestimating the distance, we reached the rendezvous—the culvert in front of the temple—a quarter of an hour ahead of time, i.e. at 6.45 a.m. Hypnotized by the waterbody, we wandered towards it and were promptly greeted by three Grey Hornbills *Ocyceros birostris* flying overhead. The musical notes of the Gold-fronted Leafbird *Chloropsis aurifrons* drew our attention. The bird itself was not easily visible as it blended perfectly into the green foliage of the *Ficus* tree it was perched upon. Besides insects, spiders and fruit, the bird feeds largely on flower nectar. The forest does have Silk Cotton *Bombax malabaricus*, Coral *Erythrina indica* and Flame of the Forest *Butea frondosa* trees. The bird is a wonderful mimic and we first thought it was a Red-vented Bulbul *Pycnonotus cafer* calling. Three Spotbill Ducks *Anas poecilorhyncha* took wing as we neared the water's edge and began circling overhead looking for more tranquil surroundings. A Red-wattled Lapwing *Vanellus indicus* began to accuse us with *Did-you-do-it*? A passing cyclist, very observant and with a lot of common sense, told us that the others in the group had arrived and were waiting at the culvert, so off we went to join the group.

This time there were four children in the group—the oldest ten and the youngest six – and they knew their birds! Our attention, in fact, was drawn by one of the children who spotted and Indian Robin *Saxicoloides fulicata* nearby. Urged on by its cheery notes we began walking into the forest. The dirt track we followed was deeply rutted by tractors, of which the Purple-rumped Sunbirds *Nectarina zeylonica* and the Purple Sunbirds *Nectarina asiatica* flying about were oblivious. The Tickell's Flowerpeckers *Dicaeum*

[1] Received for publication: 29 November 1996.
Address for communication:
[2] 35 CIEFL, Hyderabad 500007. India.
[3] 23 CIEFL, Hyderabad 500007. India.

erythrorhynchos were just as busy flitting among the treetops. Their tinny calls were more obvious than their very physical presence—as their diminutive size and their colouration make them very difficult to spot. Rose-ringed Parakeets *Psittacula krameri* winged their way noisily hither and thither. Their arboreal cousins, the Blossom-headed Parakeets *Psittacula cyanocephala* seemed equally aimless in their flights. One wonders if there is any purpose in these noisy aimless flights! A Hoopoe *Upupa epops* found an insect we never would have been able to spot. Small Green Bee-eaters *Merops orientalis* made frequent sallies into the air invariably returning to their perch with an insect in their beaks.

A White-breasted Kingfisher *Halcyon smyrnensis* was thoughtfully contemplating by the little stream flowing along the path we were treading. Some members of the group spotted a huge Rat Snake *Ptyas mucosus* basking under a tree by the side of the stream. It was soaking up the early morning's sunshine and paid no heed to the ruckus we made on spotting it and moved away reluctantly but languidly. An untidy nest of the Purple-rumped Sunbird was pointed out by one of the senior members. The nest looked like a website with cobwebs draped around an oblong pouch consisting of what looked like soft grass, dry leaves and pieces of bark. It was suspended from the tip of a branch of one of the bushes right next to the stream. A closer and more detailed examination of the house was abandoned as the builder had come back and was chattering profusely from a nearby perch. A very loud and abrupt bubbling, rattling song identified the caller as the White-browed Bulbul *Pycnonotus luteolus*. With the forest having Banyan *Ficus bengalensis* and Peepal *Ficus religiosa* trees, the figs on which the bulbul feeds, were aplenty. Apart from that there were also the berry-bearing Lantana bushes. We split up at this point and met a little while later with one group reporting the sighting of the White-browed Fantail Flycatcher *Rhipidura aureola* waltzing and pirouetting tirelessly in the foliage, hawking insects. A patch of open ground, a small boulder for a perch—and there it was—the Black Redstart *Phoenicurus ochruros*. This bird normally breeds in the Himalayas but winters down in the country. The red tail is shivered constantly, which makes it very conspicuous. A White-bellied Drongo *Dicrurus caerulescens* watched our every move very closely.

The sudden sighting of a flash of orange in a nearby bush had us quivering with anticipation for the sighting of the Paradise Flycatcher *Terpsiphone paradisi*, but it was the female which was more in evidence. The male with its gracefully flowing long tail-feathers was conspicuous by its absence. The Indian Treepie *Dendrocitta vagabunda* announced our presence to the rest of the forest in its raucous way, something that didn't bother the sprightly scarlet Little Minivets *Pericrocotus cinnamomeus*, busily looking for

food amongst the higher branches of the trees. The unobtrusive and quiet Common Wood Shrike *Tephrodornis pondicerianus* did not escape the eagle eyes of one of the members. The thin sibilant notes of the Indian White Eye *Zosterops palpebrosa* and their bold presence very close to where we were sitting had us all enthralled, especially the children in the group.

Other commitments at home meant that half the group left to fulfill them and we stayed on to lounge in the lovely green forest surroundings. We went across to the bund and began walking across it. Down below in the fields, a Black-backed Woodpecker *Chrysocolaptes festivus* was hugging the trunk of a Date Palm *Phoenix sylvestris* tree and was very still. We decided to rest in the shade of a huge Peepal tree and were promptly rewarded with the sighting of a Brahminy Kite *Haliastur indus* examining the water surface. It made one swoop and appeared to have caught something as it took off into the distance with its catch. The feeling of being watched made us look up into the staring eyes of the Shikra *Accipiter badius* perched right above us on the same tree! Having had a long look and not in a mood to exchange eye contact it took off. From where we were sitting on the bund we could see a Kestrel *Falco tinnunculus* flying and hovering on flickering wings scanning the ground below for mice and other such juicy tit bits. The water-logged rice fields around offered the Cattle Egrets *Bubulcus ibis* and Little Egrets *Egretta garzetta* a field day for insects. Down by the water`s edge on the far shore the Median Egret *Egretta intermedia* was conspicuous by its size. A Pond Heron *Ardeola grayii* stood hunched amongst the crops.

Above the trees on the hillside overlooking the paddy fields two large raptors were performing aerobatics. A closer look made them out to be a pair of Bonelli's Eagles *Hieraaetus fasciatus*. Their aerial antics had us observing their behaviour. It was obviously nesting time and as both the sexes share nest-building responsibilities, they were out collecting nesting material. They were reconnoitering the trees looking out for dry twigs and branches. We saw them perch on the top most branches of a tree and struggling with a fairly big branch. This technique of using the bodyweight to loosen the branches did not work always, so one of the birds took off and dive-bombed the tree and this time cam up successfully with a fairly large branch in its talons. Meanwhile the other bird too had colleted some branches and both the birds soared up with their 'catch`. They seemed to be in no hurry and wheeled their way slowly across the sunny skies over a distant hill towards their nesting site. The entire process from our spotting them to their disappearing took about 30 minutes. We think that the entire episode was much more than mere collecting of nesting material. It looked more like nuptial rites, as a lot of chasing, dodging and youthful caressing was evident.

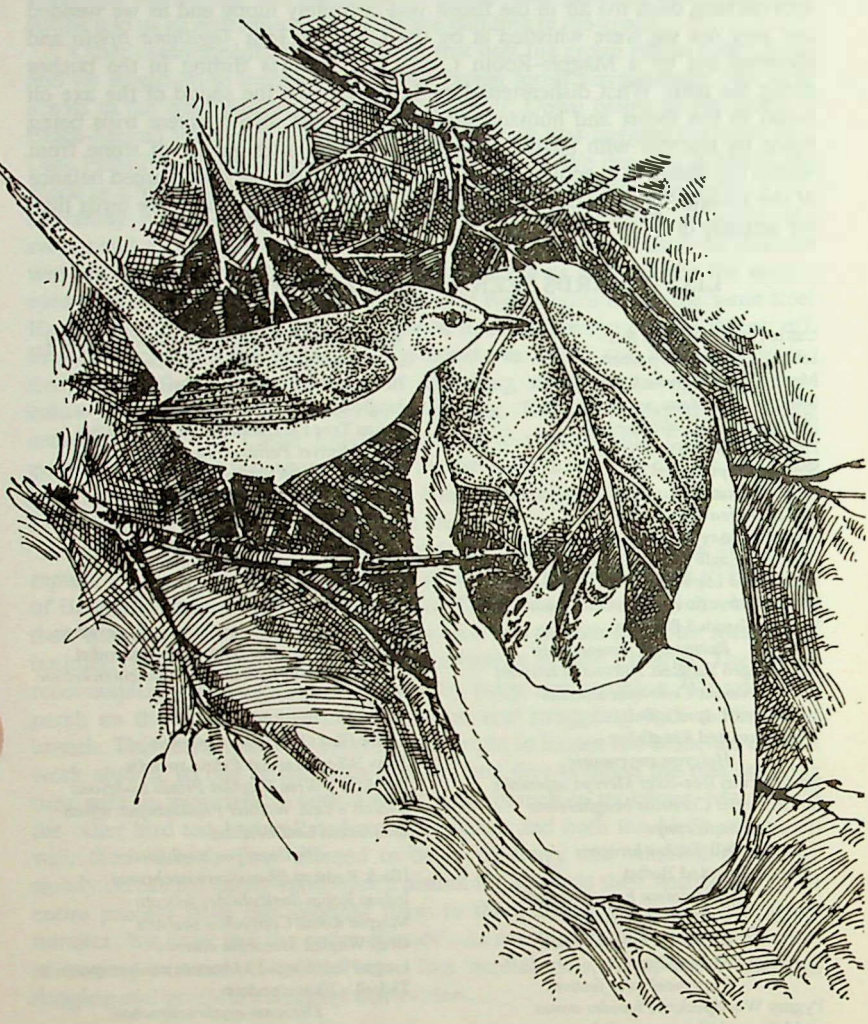
After a short break we went back to the forest for a last look in the fading light and were immediately rewarded by the sight of a Pygmy Woodpecker *Dendrocopos namus* tapping its way along the branch of a tree. With approaching dusk the air in the forest was definitely nippy and as we wended our way out we were whistled at by the Common Iora *Aegithina tiphia* and escorted out by a Magpie-Robin *Copsychus saularis* flitting in the bushes along the path. What disheartened us, however, was the sound of the axe on wood in the forest and human voices. There were also frequent trips being made by tractors with trailers that were ferrying large blocks of stone from within the forest. It is activity of this kind that disturbs the finely tuned balance of the forests and may be that is why we could not see many more birds than we actually did.

LIST OF BIRDS SEEN AT NARSAPUR ON 13-10-1996

Cattle Egret *Bubulcus ibis*
Little Egret *Egretta garzetta*
Median Egret *Egretta intermedia*
Spotbill Duck *Anas poecilorhyncha*
Brahminy Kite *Haliastur indus*
Pariah Kite *Milvus migrans*
Shikra *Accipiter badius*
White-backed Vulture *Gyps bengalensis*
Kestrel *Falco tinnunculus*
Crested Honey Buzzard *Pernis ptilorhynchus*
Bonelli's Eagle *Hieraaetus fasciatus*
Redwattled Lapwing *Vanellus indicus*
Spotted Dove *Streptopelia chinensis*
Blossom-headed Parakeet
Psittacula cyanocephala
Rose-ringed Parakeet *Psittacula krameri*
Crow-Pheasant *Centropus sinensis*
House Swift *Apus affinis*
White-breasted Kingfisher
Halcyon smyrnensis
Small Green Bee-eater *Merops orientalis*
Indian Roller *Coracias benghalensis*
Hoopoe *Upupa epops*
Grey Hornbill *Tockus birostris*
Crimson-breasted Barbet
Megalaima haemacephala
Golden-backed Woodpecker
Dinopium benghalense
Black-backed Woodpecker
Chrysocolaptes festivus
Pygmy Woodpecker *Picoides namus*
Gold-fronted Chloropsis *Chloropsis aurifrons*
White-bellied Drongo *Dicrurus caerulescens*
Brahminy Myna *Sturnus pagodarum*
House Crow *Corvus splendens*
Jungle Crow *Corvus macrorhynchos*
Indian Tree Pie *Dendrocitta vagabunda*
Little Minivet *Pericrocotus cinnamomeus*
Common Wood Shrike
Tephrodornis pondicerianus
Common Iora *Aegithina tiphia*
Redvented Bulbul *Pycnonotus cafer*
Whitebrowed Bulbul *Pycnonotus luteolus*
Jungle Babbler *Turdoides striatus*
Large Grey Babbler *Turdoides malcolmi*
Rufous-bellied Babbler *Dumetia hyperythra*
Paradise Flycatcher *Terpsiphone paradisi*
Tickell's Blue Flycatcher *Muscicapa tickelliae*
Whitebrowed Fantail Flycatcher
Rhipidura aureola
Tailor Bird *Orthotomus sutorius*
Ashy Wren-Warbler *Prinia socialis*
Franklin's Wren Warbler *Prinia hodgsonii*
Tickell's Leaf Warbler *Phylloscopus affinis*
Dull Green Leaf Warbler
Phylloscopus trochiloides
Black Redstart *Phoenicurus ochruros*
Indian Robin *Saxicoloides fulicata*
Magpie Robin *Copsychus saularis*
Grey Wagtail *Motacilla cinerea*
Large Pied Wagtail *Motacilla maderaspatensis*
Tickell's Flowerpecker
Dicaeum erythrorhynchos
Purple Sunbird *Nectarina asiatica*

Purple-rumped Sunbird *Nectarina zeylonica*
White Eye *Zosterops palpebrosa*
Baya *Ploceus philippinus*

Red Munia *Estrilda amandava*
Spotted Munia *Lonchura punctulata*
White-throated Munia *Lonchura malabarica*



HOUSING PROBLEMS FOR THE BAYAS![1]

J.V.D. MOORTY[2] & VINAY TOTAWAR[3]

Building sites and houses adjacent to roads and thoroughfares have always had the real estator on the lookout for such prime locales. For the poor Weaver-birds, the Bayas *Ploceus philippinus*, however, such a busy road proved an absolute nuisance leading to their abandoning a half-built colony of about a dozen nests on the branches of a young *Acacia* tree right next to a pathway in the interiors of Osmania University (OU) campus.

On 1 September, late in the afternoon we decided to go birding on the Osmania University campus. We went deep into the campus towards Kakatiyanagar, Habshiguda. This part of the campus is behind the professors' flats. Nearby there are two small waterbodies. This part of the OU campus is a criss-cross of pathways among bushes, shrubs and not very big trees. The pathway we are talking about is more of a *kachcha* road (10 feet wide) that goes alongside a huge water pipeline. This road goes through thick vegetation, mostly bushes and medium trees, but quite a big stretch of this path has big Rain Trees *Enterolobium saman* on both the sides. As we were going through this stretch we suddenly heard a sparrow-like *chit-chit-chit* and saw flashes of brilliant yellow on a medium size *Acacia* tree. We had never seen Bayas from such a close distance (10-15 feet) and so many of them together (approximately 30 birds). The Bayas were in their element, busy weaving their marvelous homes. These ingeniously and skillfully constructed nests of Baya are such a *chef-d'oeuvre* of nest building that our metaphors and similes (retort-shaped structure, inverted chimney of a kerosene lamp, strange bottle shaped structure) hardly manage to describe the beauty of the male Baya's creative efforts!

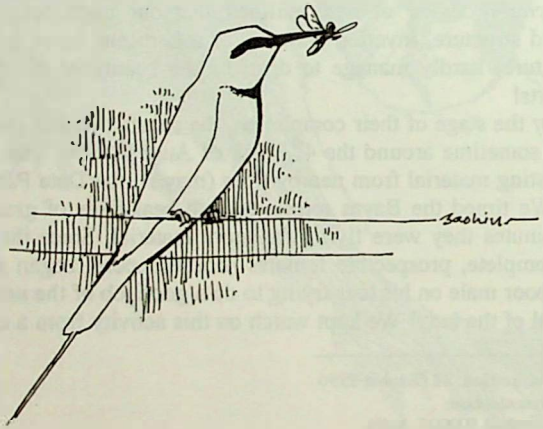
Going by the stage of their completion, the construction of the nests must have started sometime around the 4th week of August 1996. The Bayas were gathering nesting material from nearby trees (may be the Date Palms *Phoenix sylvestris*). We timed the Bayas returning with beak-fulls of grassy fibers—every 2-3 minutes they were flying for more material. Since the nests were two-thirds complete, prospective females (housekeepers) began site-hunting, keeping the poor male on his toes trying to do a good job of the nest to win the final approval of the lady! We kept watch on this activity from a safe distance

[1] Received for publication: 22 October 1996.
Address for communication:
[2] 35 CIEFL, Hyderabad 500007. India.
[3] 23 CIEFL, Hyderabad 500007. India.

of about 100 feet from under a Neem *Azadirachta indica* which later turned out to be the regular day time roost of four Spotted Owlets *Athene brama* (we soon got used to being stared at, eventually the owlets also got disinterested in us and went back to their day dreaming!).

Around this time of the year August-September (Indian months *Shraavan-Bhadrapad*) farmers observe community-picnics *Vanabhojanaalu* (a Telugu social custom) whole communities together (almost 50-60 people together in families) go into the forest, cook their food and make merry. During this period, around the Ganesh Festival, hordes of picnickers descend on the OU campus picnicking under the big trees or in the clearings among vegetation. The salient feature of these picnics is cooking outdoors. This kind of activity presents a chaotic situation even to a casual onlooker. On Sunday, 1 September 1996 one such picnic was organized not very far from the *Acacia* tree chosen by the weavers as the site for their sweet home. We regretted not having brought a camera, as we could not capture some lovely moments of the nest building activity of the Bayas. We decided to come back the next morning and take a few snaps. We did get back on 3 September in the morning. To our misfortune, the Bayas were gone! The revellery must have been nothing short of a pandemonium for the Bayas! They gave up their nests to move to a quieter place. We tried to locate where the Bayas were setting up their new homes. But to no avail!

With the nesting season drawing to a close, we are very pessimistic about a new brood of Bayas emerging into the world for this flock, this year!



RETURN OF THE SMALL GREEN BEE-EATER *MEROPS ORIENTALIS*[1]

VINAY TOTAWAR[2]

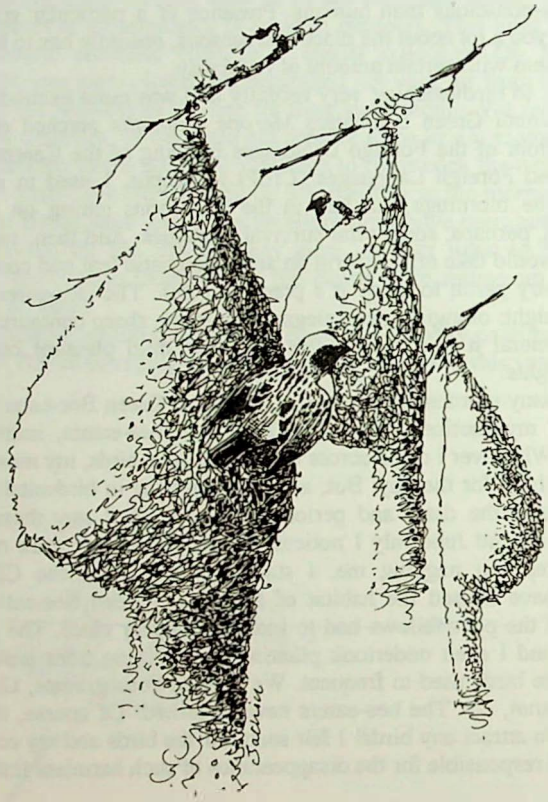
Nature has many different ways of manifesting its cycles and states. We only have to keep our eyes and mind open to perceive Mother Nature's designs. Nature becomes violent only when we turn a deaf ear to her. The fact of appearance and disappearance of certain species of birds is one such manifestation of Natures cycles. Birds follow a strict calendar and are far more time-conscious than humans. Presence of a particular species of birds could tell you a lot about the place and seasons, one only has to be vigilant and observe them with certain amount of regularity.

I took to birdwatching very recently and was quite excited to discover a party of Small Green Bee-eaters *Merops orientalis* perched on the electric wires in front of the Foreign Languages building of the Central Institute for English and Foreign Languages (CIEFL) Campus. I used to see them very often in the mornings and late in the afternoons sitting on electric wires discussing, perhaps, some vital survival strategies. And then, suddenly one of the birds would take off, perform an aerial acrobatic feat and coolly glide back onto its wiry perch to enjoy it's precious catch. The Bee-eater in flight is a beautiful sight: orangish green elegant wingspan, sharp contours and a slender tail. In general it is a smart little bird with mild pleasant colouration. No jarring brights.

For many months the sighting of the Small Green Bee-eater was a regular feature of my routine. Every time I saw the bee-eaters, immense was my pleasure. Whenever I came across these wondrous birds, my morale used to be unusually high for the day. But, as I was a novice in birdwatching, I did not make note of the dates and periods during which I saw these birds. Then suddenly, around June-July I noticed that the bee-eaters were missing. Their absence kept on nagging me. I started thinking that the CIEFL campus dwellers have abused the habitat of the Small Green Bee-eater to such an extent that the poor fellows had to look for a better place. The guilty feeling persisted and I even undertook planting fruit-bearing trees around the place where these birds used to frequent. We planted Pomegranate, Guava, Custard Apple, *Jamun*, *etc*. The bee-eaters never returned! Of course, the trees were too small to attract any birds! I felt sorry for the birds and my conscience was holding us responsible for the disappearance of such harmless little birds.

[1] Received for publication: 22 October 1996.
[2] *Address for communication*: 23 CIEFL, Hyderabad 500007. India.

Lo and behold, on 10 October 1996, early in the morning, around 9.30 a.m., I saw a party of 6-7 bee-eaters perched on their usual electric wire basking in the sun, waiting for a catch. I cannot express the joy that I experienced. My morale-boosters were back! And I felt quite awkward at my ignorance about the bee-eater: they do migrate locally within the same biotope. Watch out for the bee-eaters! They come back, when the humidity goes down, when the days start becoming shorter, when the sun gets cool and pleasant after the summer's fury and idling during the monsoons, when you start feeling a sweet chill in the air. For me, the Small Green Bee-eater is the harbinger of winter!



CROW-PHEASANT *CENTROPUS SINENSIS* TRYING TO HUNT A LARGE SIZE FROG[1]

VINAY TOTAWAR[2], J.V.D. MOORTY & SVATI TOTAWAR

The Coucal is the most common Cuckoo sighted on the Central Institute for English and Foreign Languages (CIEFL) Campus. We see Coucals *Centropus sinensis* very often on one of the fairly big trees of *Angrezi imli* (Telugu: *Siima Chinta*) *Pithecollobium dulce*. You can see them very often in the *Casuarina equisetifolia* thicket also.

One of the early summer forenoons (20 April, 11.30 a.m.) we heard a ruckus created by House Crows *Corvus splendens*. We looked out of the window and found about 10-15 House Crows cawing ceaselessly in high pitch. We could not understand what the matter was! On a closer scrutiny we discovered that a well-fed Coucal was after an equally well-fed frog (about 150gm).

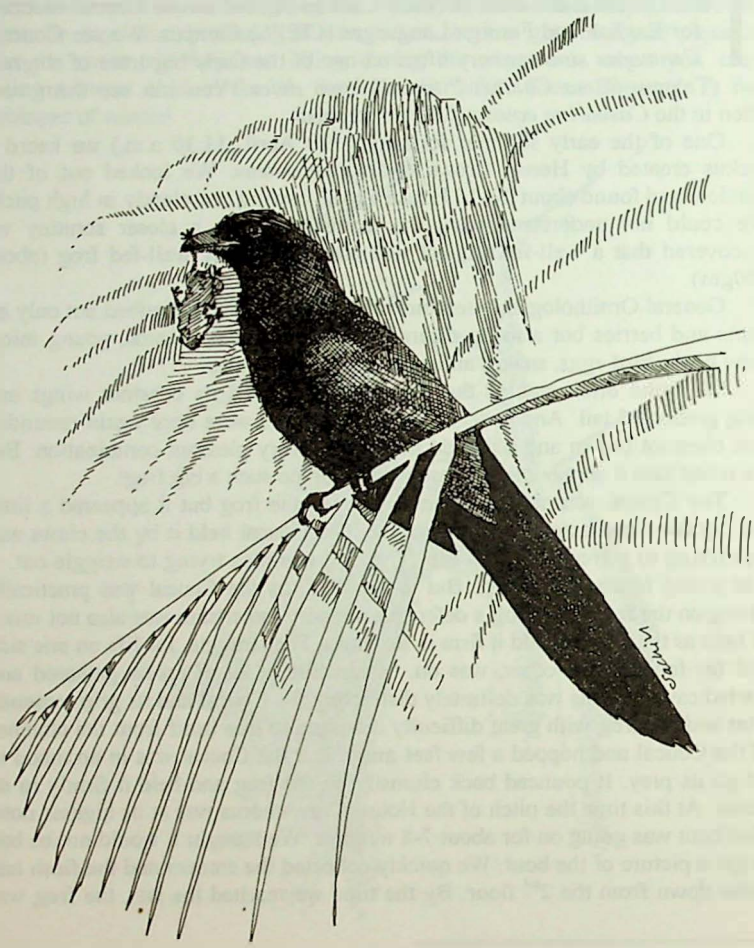
General Ornithological literature mentions that Cuculidae feed not only on fruits and berries but also on caterpillars, large insects, lizards, young mice, baby birds, bird eggs, snakes and other small vertebrates.

We quite often sighted the Coucal and enjoyed its chestnut wings and long graduated tail. And every time we saw it, we were once again reminded that chestnut brown and black do not make a very pleasant combination. But we never saw it on a hunting mission and that too such a big frog!

The Coucal was struggling to overpower the frog but it appeared a little too big for the chestnut winged cuckoo. The Coucal held it by the claws and was trying to pierce it with its bill. The frog was also trying to wriggle out. It was trying to hop and jump. But to no avail, as the Coucal was practically sitting on the frog. The frog's defensive slippery moist skin was also not much of help as the Coucal held it firm in its claws. The struggle, for life on one side and for food on the other, was on. Meanwhile, a lot of crows gathered and started cawing. This was definitely distracting the Coucal and its grip loosened a bit and the frog with great difficulty managed to free itself from the clutches of the Coucal and hopped a few feet away. But the Coucal was in no mood to let go its prey. It pounced back clumsily on the frog and held it firmly in its claws. At this time the pitch of the House Crow chorus was at its highest note. This bout was going on for about 7-8 minutes. We thought it would not be bad to get a picture of the bout. We quickly collected the camera and the flash and came down from the 2nd floor. By the time we reached the site, the frog was

[1] Received for publication: 22 October 1996.
[2] *Author for communication*: 23 CIEFL, Hyderabad 500033, India.

under full control of the Coucal, but now the crows were closing in on the Coucal. The Coucal tightened the grip on the frog and flew away into the foliage of a nearby Silk Cotton Tree *Bombax malabarica* and perched on one of its branches to enjoy his (quarter) pound of flesh at leisure. The House Crows cawed for a while and dispersed disappointed.

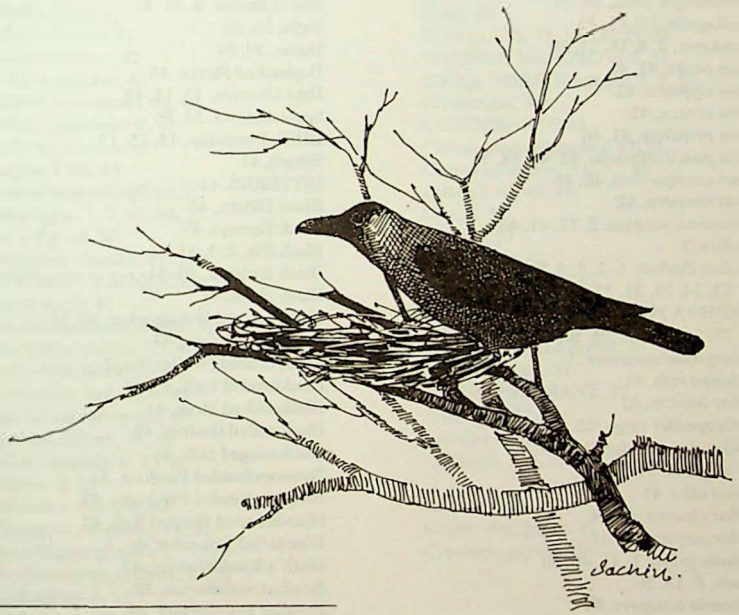


BREEDING BEHAVIOUR OF THE HOUSE CROW *CORVUS SPLENDENS*[1]

HYDER JAFFER[2]

On 4 June, while I was purchasing grocery, I had a unique opportunity to observe the mating of the House Crow *Corvus splendens* for the first time. The female was seen standing in the nest cavity in a huge Tamarind *Tamarindus indus*, and the male which was 2 feet away on a branch flew down and copulated for a duration of 3 seconds, and as it dismounted, another male from near by mated with the same female and flew away.

[**Editors' Note**: In their *Compact Handbook of the Birds of India and Pakistan* (1987) Sálim Ali and S. Dillon Ripley have this to say. "Copulating pairs are frequently mobbed by other crows, and there is good circumstantial evidence for more than occasional promiscuity in the mating."]



[1] Received for publication: 16 June 1998.
[2] *Address for correspondence*: 18-7-360/8 Hussaini Kothi, Yakutpura, Hyderabad 500023.

INDEX

"

"Pulla Goora Pully, 6

A

A. cinerea, 2
Acacia, 5, 53, 54
Acacia nilotica, 5
Accipiter badius, 46, 50, 51
Acridotheres tristis, 47
Acrocephalus dumetorum, 47
Aegithina tiphia, 51
Alauda gulgula, 46
Alcedo atthis, 46
Amaurornis akool, 42
Amaurornis phoenicurus, 42
Ambarjiepet Tank, 13, 16
Anakapalle, 13, 15, 17
Anantapur, 2, 8, 18, 21, 30
Anas acuta, 42, 46
Anas clypeata, 42
Anas crecca, 42
Anas penelope, 42, 46
Anas poecilorhyncha, 42, 46, 48, 51
Anas querquedula, 42, 46
Anas strepera, 42
Anastomus oscitans, 2, 11, 41, 46
Andhra, 3
Andhra Pradesh, 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 23, 24, 28, 31, 32, 33, 35, 43, 44
ANDHRA PRADESH, 12, 13, 15, 16, 20, 25, 26, 27, 28, 29, 30, 33, 41
Anhinga melanogaster, 1
Anhinga rufa, 41
Anser indicus, 42
Anthropoides virgo, 42
Anthus novaeseelandiae, 47
Apus affinis, 51
Ardea alba, 41
Ardea cinerea, 41, 46
Ardea purpurea, 2, 41
Ardeola grayii, 1, 41, 46, 50
Aredu, 6, 13, 20
Arenaria interpres, 42
Ashy Wren Warbler, 51
Ashy Wren-Warbler, 47
Ashycrowned Finch-Lark, 46
Asian Openbill, 2, 3, 4
Atapaka, 5, 13, 15, 17
Atapaka Heronry, 5
Atapaka Village, 13, 15, 17
Athene brama, 54
Australian Blackfronted Plover, 42
Avocet, 42
AVOCETS, 42
Aythya ferina, 42, 46
Aythya fuligula, 42, 46
Aythya nyroca, 42
Azadirachta indica, 54

B

Baillon's Crake, 42
Banyan, 49
Barheaded Goose, 42
Bay of Bengal, 5, 33, 34
Baya, 52, 53
Bayas, 53, 54
Baybacked Shrike, 46
Bayi Cheruvu, 13, 15, 19
bee-eaters, 45, 55, 56
BHEL Township, 13, 15, 17
Bittern, 41
BITTERNS, 41
Black Bittern, 41
Black Drongo, 47
Black Ibis, 2, 3, 41
Black Redstart, 49, 51
Black Stork, 41
Black-backed Woodpecker, 50, 51
Blackbellied Tern, 43
Black-headed (White) Ibis, 2
Blackheaded Gull, 43, 46
Blackknecked Stork, 41
Black-tailed Godwit, 42
Blackwinged Stilt, 46
Blossom-headed Parakeet, 51
Blossom-headed Parakeets, 49
Blue-breasted Banded Rail, 42
Blue-tailed Bee-eater, 46
Blyth's Reed Warbler, 47
Bombax malabarica, 58
Bombax malabaricus, 48
Bonelli's Eagle, 51
Bonelli's Eagles, 50
Borassus flabellifer, 5

Bordilingamapada, 13, 15, 18
Botaurus stellaris, 41
Brahminy Duck, 42
Brahminy Kite, 44, 45, 46, 50, 51
Brahminy Myna, 47, 51
Bronzewinged Jacana, 42
Brown Crake, 42
Brown Shrike, 46
Brownheaded Gull, 43, 46
Bubulcus ibis, 1, 41, 46, 50, 51
Buchupalle, 5, 6, 13, 21
Buchureddipalem, 6
Budham village, 13
Budham Village, 15, 18
Burgess, 6, 13, 20
Bush Quail, 46
Butea frondosa, 48
Butorides striatus, 41

C

Calidris alba, 42
Calidris alpina, 42
Calidris minuta, 42
Calidris minutus, 46
Calidris temminckii, 42, 46
Calidris tenuirostris, 42
Calidris testacea, 42
Caspian Tern, 43
Casuarina equisetifolia, 57
Cattle Egret, 1, 3, 41, 46, 51
Cattle Egrets, 50
Centropus sinensis, 51, 57
CENTROPUS SINENSIS, 57
Ceryle rudis, 46
Charadrius alexandrinus, 42, 46
Charadrius dubius, 42, 46
Charadrius hiaticula, 42
Charadrius melanops, 42
Charadrius mongolus, 42
Chestnut Bittern, 41, 46
Chilakalampadu, 6, 13, 20
Chittoor, 2, 19
Chlidonias hybrida, 43
Chloropsis aurifrons, 48, 51
Chota Nagpur plateau, 2
Chrysocolaptes festivus, 50, 51
Chudavaram, 4, 15
Chudavaram, 13, 15, 17
Ciconia ciconia, 41
Ciconia episcopus, 2, 41
Ciconia nigra, 41
Circus aeruginosus, 45, 46
Cisticola juncidis, 47
Clamator jacobinus, 46
Coastal Andhra, 12
Coconut, 5
Comb Duck, 42
Commercial exploitation, 5
Common Iora, 51
Common Pochard, 42, 46
Common Redshank, 42
Common Sandpiper, 42, 46
Common Shelduck, 42
Common Teal, 42
Common Tern, 43
Common Wood Shrike, 50, 51
Coot, 42, 46
coots, 44
COOTS, 42
Copsychus saularis, 51
Coracias benghalensis, 46, 51
Coral, 48
Coringa, 3, 5, 13, 17, 28, 29, 34
CORINGA MANGROVES, 31
Coringa Wildlife Sanctuary, 3, 5, 13, 17
Cormorants, 30
CORMORANTS, 41
Corvus macrorhynchos, 47, 51
Corvus splendens, 51, 57, 59
Cotton Teal, 42, 46
Coucal, 57
Coucals, 57
Crab Plover, 42
CRAB-PLOVERS, 42
CRANES, 42
Crested Honey Buzzard, 51
Crimson-breasted Barbet, 51
Crow-Pheasant, 51
CROW-PHEASANT, 57
Cuculidae, 57
Cuculus varius, 46
Cuddapah, 2, 5, 6, 8, 9, 12, 13, 15, 18, 21, 23
Curlew, 42
Curlew-Sandpiper, 42
Cypsiurus parvus, 46

D

Darter, 41
Date Palm, 50

Date Palms. 53
Deccan. 2
Demoiselle Crane. 42
Dendrocitta vagabunda. 49. 51
Dendrocopos nanus. 51
Dendrocygna bicolor. 42
Dendrocygna javanica. 42. 46
Dicaeum erythrorhynchos. 49. 51
Dicrurus adsimilis. 47
Dicrurus caerulescens. 49. 51
Dindi Project. 12
Dinopium benghalense. 51
doves. 45
Dromas ardeola. 42
ducks. 36. 44. 45
DUCKS. 42
Dull Green Leaf Warbler. 51
Dumetia hyperythra. 51
Dunlin. 42

E

E. alba. 2
E. garzetta. 2
E. intermedia. 2
East Coast. 3
East Godavari. 6
East Godavari district. 6
Eastern Common Crane. 42
Eastern Ghats. 2. 9. 28. 29
Eastern Golden Plover. 42
Eastern Knot. 42
Eastern Large Egret. 41
Eastern Purple Heron. 41
Eastern Swallow. 46
Edurubatta. 5
EGRETS. 41
Egretta alba. 46
Egretta garzetta. 41. 46. 50. 51
Egretta gularis. 2. 9. 10. 41
Egretta intermedia. 10. 41. 46. 50. 51
Enterolobium saman. 53
Ephippiorhynchus asiaticus. 41
Eremopterix grisea. 46
Eruru. 14
Erythrina indica. 48
Estrilda amandava. 52
Ethirapattu. 5. 7. 13. 15. 18

F

Falco tinnunculus. 46. 50. 51
Fantail Snipe. 42
Ficus. 6. 48
Ficus bengalensis. 49
Ficus religiosa. 49
Flame of the Forest. 48
Flamingo. 42. 46
FLAMINGOS. 41
Francolinus pondicerianus. 46
Franklin's Wren Warbler. 51
Fulica atra. 42. 46

G

Gadwall. 42
Gallicrex cinerea. 42
Gallinago gallinago. 42
Gallinago minima. 42
Gallinago nemoricola. 42
Gallinago stenura. 42
Gallinula chloropus. 42
Ganapavaram. 6. 20
Ganapavaram Pelicanry. 6. 20
Gantavaram. 18
Gantavarum. 13
Garganey. 42. 46
GEESE. 42
Gelochelidon nilotica. 43. 46
Gharepalli. 12
Glareola lactea. 42
Glareola pratincola. 42
Glossy Ibis. 41
Godavari. 2. 3. 6. 17. 20. 21. 28. 29. 30. 31. 33. 34. 39
Godavari and Krishna deltas. 3
GODAVARI MANGROVES. 31
Godavari-Krishna Gap. 2
Golden Oriole. 46
Golden-backed Woodpecker. 51
Gold-fronted Chloropsis. 51
Gold-fronted Leafbird. 48
Great Blackheaded Gull. 43
Great Cormorant. 1
Great Crested Grebe. 41
Great Egret. 2
grebes. 44
GREBES. 41
Green Sandpiper. 42
Greenshank. 42. 46
Grey Heron. 2. 3. 41. 46

Grey Hornbill, 51
Grey Hornbills, 48
Grey Partridge, 46
Grey Pelicans, 30
Grey Plover, 42
Grus antigone, 42
Grus grus, 42
Gudur, 6, 44, 45
GUDUR TANK, 44, 46
Gujarat, 3, 4, 8, 10
Gullbilled Tern, 43, 46
Gulls, 44
GULLS, 42
Gunaparam, 6, 21
Gunnavaram, 6, 13, 21
Guntur, 2, 17, 18, 23, 24
Gyps bengalensis, 51

H

Halcyon smyrnensis, 46, 49, 51
Haliastur indus, 44, 46, 50, 51
Hawk–Cuckoo, 46
herouries, 1, 2, 3, 4, 5, 6, 7, 8, 11, 13, 15, 24
HERONS, 41
Herring Gull, 43
Hieraaetus fasciatus,50, 51
Himalayas, 49
Himantopus himantopus, 42, 46
Himayat Sagar, 28, 29
Hirundo daurica, 46
Hirundo rustica, 46
Hoopoe, 49, 51
House Crow, 51, 57, 59
House Crows, 57, 58
House Swift, 51
HUNTING, 37
Hyderabad, 8, 9, 10, 11, 13, 17, 23, 24, 28, 30, 31, 43, 44, 48, 53, 55, 57, 59
Hydrophasianus chirurgus, 42, 46
Hydroprogne caspia, 43

I

Ibises, 30
IBISES, 41
Ichapuram, 4, 13, 15, 16
ICRISAT Campus, 10, 13, 15, 16
India, 1, 4, 6, 8, 9, 10, 11, 23, 28, 32, 33, 35, 36, 43, 44, 48, 53, 55, 57, 59
Indian Blackwinged Stilt, 42
Indian Moorhen, 42
Indian Myna, 47
Indian Reef Heron, 10, 41
Indian River Tern, 43
Indian Robin, 48, 51
Indian Roller, 46, 51
Indian Sarus Crane, 42
Indian Shag, 1, 41, 46
Indian Shikra, 46
Indian Skimmer, 43
Indian Tree Pie, 51
Indian Treepie, 49
Indian Whiskered Tern, 43
Indian White Eye, 50
Indian Wren-Warbler, 47
Ixobrychus cinnamomeus, 41, 46
Ixobrychus flavicollis, 41

J

JACANAS, 42
Jack Snipe, 42
Janugamilli Village, 5
Janugamulli, 8, 13, 21
Jungle Babbler, 47, 51
Jungle Crow, 47, 51

K

Kandukur, 6
Kanigiri Reservoir, 4, 13, 19
Karimnagar, 12
Karnataka, 8
Kentish Plover, 42, 46
Kestrel, 46, 50, 51
kingfishers, 45
Kirkpatrick, 3, 4, 6, 9, 13, 21
Kirkpatrick Heronry, 6
Kokkare Bellur, 8, 11
Kolair, 6, 13, 20
Kolamaru, 6, 13, 20
Kolleru, 3, 5, 6, 7, 10, 13, 17, 20, 28, 29, 32, 33, 39, 43
Kolleru Lake, 3
KOLLERU LAKE, 30, 32, 39
Kolleru Pelicanries, 6
Kolleru Pelicanry, 5
Kottavelam, 32
Krishna, 2, 3, 10, 13, 17, 18, 28, 29, 30, 33, 34, 39

Krishna Mangroves. 3
KRISHNA MANGROVES. 30, 32
Kurnool. 2, 12

L

Labaku. 13, 15, 18
Laknavaram. 29
Lakshmapura Lake. 13
Lakshma-pura Lake. 17
Lanius cristatus. 46
Lanius vittatus. 46
Lankavanidibba. 13, 18
Lantana. 49
Large Cormorant. 41
Large Egret. 46
Large Grey Babbler. 51
Large Indian Pratincole. 42
Large Pied Wagtail. 47, 51
Large Whistling Teal. 42
larks. 45
Larus argentatus. 43
Larus brunnicephalus. 43, 46
Larus fuscus. 43
Larus genei, 43
Larus ichthyaetus. 43
Larus ridibundus. 43, 46
Leptoptilos javanicus. 41
Lesser Adjutant. 41
Lesser Blackbacked Gull. 43
Lesser Flamingo. 42
Lesser Whistling Teal. 42, 46
Limosa limosa. 42
Little Brown Dove. 46
Little Cormorant. 1, 3, 4, 41, 46
Little Egret. 2, 3, 4, 41, 46, 51
Little Egrets. 50
Little Grebe. 41, 46
Little Green Heron. 41
Little Minivet. 51
Little Minivets. 49
Little Ringed Plover. 42, 46
Little Stint. 42, 46
Little Tern. 43
Lonchura malabarica. 52
Lonchura punctulata. 52
Longtailed Tropic Bird. 41

M

Machilipatnam. 30
Magpie Robin. 51
Magpie-Robin. 51
Mahbubnagar. 2, 12
Mahbub-nagar. 17
Maipadu. 6
Mandapalle. 3, 4, 13, 15
Mandapalli. 15, 17
MANGROVES. 33, 34
Manjira. 4, 5, 9, 13, 15, 16, 29, 30, 31, 32
Manjira Barrage. 4, 5, 13, 15
MANJIRA BARRAGE. 30
Manjira Island. 16
March Sandpiper. 42
Marsh Harrier. 46
MARSHES. 34, 35
Medak. 2, 16, 30, 48
Median Egret. 41, 46, 50, 51
Megalaima haemacephala. 51
Merops orientalis. 46, 49, 51, 55
MEROPS ORIENTALIS. 55
Merops philippinus. 46
Metopidius indicus. 42
Mettapalem. 13, 15, 17
Milvus migrans. 44, 46, 51
Mirafra erythroptera. 46
Motacilla flava. 47
Motacilla maderaspatensis. 47, 51
Muscicapa tickelliae. 51
Musi. 29
Mycteria leucocephala. 2, 8, 11, 41

N

Nachugunta. 32
Nallamalai Hills. 2
Narasapur Town. 13, 16
Narsapur. 48
NARSAPUR. 51
Naupada. 28, 29, 32, 35
Navipet. 13, 20
Nayana Cheruvu. 13, 19
Nectarina asiatica. 48, 51
Nectarina zeylonica. 48, 52
Neem. 54
Nehru Zoological Park. 4, 13, 20
Nelapattu. 9, 11, 28, 30, 44
NELAPATTU. 31
Nellapattu. 4, 5, 7, 8, 9, 11, 13, 15, 19, 32
Nellore. 3, 6, 18, 19, 21, 30, 31, 33
Nellore district. 6, 30, 33
NELLORE DISTRICT. 44

Netta rufina, 42, 46
Nettapus coromandelianus, 42, 46
Night Heron, 1, 41
Night Herons, 30
Nirkula, 12
Nizamabad, 2, 20
Numenius arquata, 42
Numenius phaeopus, 42
Nycticorax nycticorax, 1, 41

O

Ocyceros birostris, 48
Openbill, 3, 11, 30, 41
Openbill Stork, 46
Openbill Storks, 11, 30
Oriental Darter, 1, 3
Oriolus oriolus, 46
Orthotomus sutorius, 47, 51
Osman Sagar, 28, 29
Osmania University, 9, 11, 23, 24, 53

P

P. fuscicollis, 1
P. niger, 1
Paddyfield Pipit, 47
Painted Snipe, 42
Painted Stork, 2, 3, 8, 11, 41
Painted Storks, 6, 10, 30
Pakhal, 13, 16, 28, 29, 32
Pakhal Lake, 13, 16
PAKHAL LAKE, 30
Palm Swift, 46
Palmakole Tank, 13, 17
Palmyra Palm, 5
Pamir Lesser Sand Plover, 42
Paradise Flycatcher, 49, 51
Pariah Kite, 46, 51
Pariah Kites, 44
Parkal, 13, 20
Patchava, 5, 13, 15, 18
Patchava Village, 5
Pedda Tippa Samudram, 13, 15, 19
Peepal, 49, 50
Pelecanus philippensis, 1
pelicanries, 5, 6, 9
pelicanry, 5, 6, 10
PELICANS, 41
Pelicanus philippensis, 41
Pengamga, 29
Pennar, 28, 29
Perdicula asiatica, 46
Pericrocotus cinnamomeus, 49, 51
Pernis ptilorhynchus, 51
Phaethon lepturus, 41
Phalacrocorax carbo, 1, 41
Phalacrocorax fuscicollis, 41, 46
Phalaropus lobatus, 42
Pheasant-tailed Jacana, 42, 46
Philomachus pugnax, 42
Phoenicomaias minor, 42
Phoenicopterus roseus, 42, 46
Phoenicurus ochruros, 49, 51
Phoenix sylvestris, 50, 53
Phylloscopus affinis, 51
Phylloscopus trochiloides, 51
Picoides nanus, 51
Pied Crested Cuckoo, 46
Pied Kingfisher, 46
Pink-headed Duck, 42
Pintail, 42, 46
Pintail Snipe, 42
Pithecollobium dulce, 57
Platalea leucorodia, 2, 41
Plegadis falcinellus, 41
Ploceus philippinus, 52, 53
PLOVERS, 42
Pluvialis dominica, 42
Pluvialis squatarola, 42
POACHING, 37
Pocharam, 28, 32
POCHARAM RESERVOIR, 30
Podiceps cristatus, 41
Podiceps ruficollis, 41, 46
Pond Heron, 1, 3, 41, 46, 50
Porphyrio porphyrio, 42
Porzana fusca, 42
Porzana pusilla, 42
Prakasam, 6, 18, 21
Prakasam district, 6
Pranahita, 29, 32
PRATINCOLES, 42
Prinia hodgsonii, 51
Prinia socialis, 47, 51
Prinia subflava, 47
Pseudibis papillosa, 2, 41
Psittacula cyanocephala, 49, 51
Psittacula krameri, 46, 49, 51
Ptyas mucosus, 49
Pulicat, 3, 6, 11, 28, 29, 32, 33, 40, 44
PULICAT, 31, 40

Pulicat Lagoon. 3
PULICAT LAGOON. 31
Pulicat Lake. 6. 40
Pulla Goora Pully Pelicanry. 13. 21
Pullagurapalle. 6
Puniakshetram. 4. 13. 15
Puniakshet-ram Village, 17
Punyakshetram. 30
Purple Heron. 2. 3
Purple Moorhen. 42
Purple Sunbird. 51
Purple Sunbirds. 48
Purple-rumped Sunbird. 49. 52
Purple-rumped Sunbirds. 48
Pycnonotus cafer. 47. 48. 51
Pycnonotus luteolus. 49. 51
Pygmy Woodpecker. 51

R

RAILS. 42
Rain Trees. 53
Rallus striatus. 42
Ramappa. 12. 28. 29
Ramgampet. 13. 15. 16
Ramgreddi. 2. 17. 20
Rasupalle. 13. 15. 18
Rat Snake. 49
Rayalseema. 2. 12
Recurvirostris avosetta. 42
Red Munia. 52
Redcrested Pochard. 42. 46
Reddipalle. 12
Red-necked Phalarope. 42
Redrumped Swallow. 46
Redvented Bulbul. 47, 51
Red-vented Bulbul. 48
Redwattled Lapwing. 42. 46. 51
Red-wattled Lapwing. 48
Redwinged Bush Lark. 46
Reef Egret. 6
RESERVOIRS. 34. 35
Rhipidura aureola. 49. 51
Rhodonessa caryophyllacea. 42
Ringed Plover, 42
River Krishna. 2
River Tern. 46
River Terns. 30
RIVERS. 34
Roseringed Parakeet. 46
Rose-ringed Parakeet. 51
Rose-ringed Parakeets. 49
Rostratula benghalensis. 42
Ruddy Crake. 42
Ruff. 42
Rufous-bellied Babbler. 51
Rynchops albicollis. 43

S

Sanderling. 42
SANDPIPERS. 42
Sangaipelta. 13. 15. 16
Sarepalle. 6. 13
Sarkidiornis melanotos. 42
Savicoloides fulicata. 48. 51
Scolopax rusticola. 42
Secunderabad. 48
Shikra. 50. 51
Short Pelicanry. 6. 13. 21
Shoveller. 42
shrikes. 45
Siddapuram. 12
Silk Cotton. 48. 58
Simpson Estate. 7
Singur. 30
SINGUR. 30
Slender billed Gull. 43
Small Blue Kingfisher. 46
Small Green Bee-eater. 46. 51. 55. 56
SMALL GREEN BEE-EATER. 55
Small Green Bee-eaters. 49. 55
Small Indian Pratincole. 42
Small Indian Skylark. 46
Smaller Egret. 2
SNIPE. 42
Sociable Lapwing. 42
Spoonbill, 41
Spoonbills. 6
SPOONBILLS. 41
Spotbill Duck. 42. 46. 51
Spotbill Ducks. 48
Spot-billed Pelican. 1. 3. 4. 5
Spot-billed Pelicans. 5. 6. 7
Spotted Dove. 46. 51
Spotted Munia. 52
Spotted Owlets. 54
Spotted Redshank. 42
Spotted Sandpiper. 42. 46
Spotted-billed Pelican. 41
Spurwinged Plover. 42
Srikakulam. 16. 30

Sterna acuticauda, 43
Sterna albifrons, 43
Sterna aurantia, 43, 46
Sterna hirundo, 43
STILTS, 42
STORKS, 41
Streaked Fantail Warbler, 47
Streptopelia chinensis, 46, 51
Streptopelia senegalensis, 46
Sturnus pagodarum, 47, 51
swallows, 45
SWAMPS, 34, 35
swifts, 45

T

Tada, 13, 19
Tadorna ferruginea, 42
Tadorna tadorna, 42
Tailor Bird, 47, 51
Tamarind, 5, 59
Tamarindus indus, 59
Tamil Nadu, 7, 23, 31, 33, 44
TANK IRRIGATION, 35
Telangana, 2, 12
Telikunchi, 4, 13, 15, 16, 30
Telineelapuram, 5, 7, 13, 15, 30
Telineela-puram, 16
Temminck's Stint, 42, 46
Tephrodornis pondicerianus, 50, 51
Terek Sandpiper, 42
TERNS, 42
Terpsiphone paradisi, 49, 51
Threskiornis aethiopica, 41
Threskiornis melanocephalus, 2
Tickell's Blue Flycatcher, 51
Tickell's Flowerpecker, 51
Tickell's Flowerpeckers, 48
Tickell's Leaf Warbler, 51
Timmavacheruvu, 30
Tockus birostris, 51
Tringa erythropus, 42
Tringa glareola, 42, 46
Tringa hypoleucos, 42, 46
Tringa nebularia, 42, 46
Tringa ochropus, 42
Tringa stagnatilis, 42
Tringa terek, 42
Tringa totanus, 42
TROPICBIRDS, 41
Tsunduru Village, 5, 13, 15, 18
Tufted Duck, 42
Tufted Pochard, 46
Tungabhadra, 28, 29
Turdoides malcolmi, 51
Turdoides striatus, 47, 51
Turnstone, 42

U

Uppalapadu, 5, 11, 13, 15, 18, 23
Upupa epops, 49, 51

V

Vanellus gregarious, 42
Vanellus indicus, 42, 46, 48, 51
Vanellus malabaricus, 42
Vanellus spinosus, 42
Vedurupattu, 5, 11
Veerapur, 7, 13, 15, 18
Veerapur Village, 13, 15, 18
Velamavari Palem Village, 13, 15, 18
Veltur, 13, 15, 17
Venkatapura Village, 13, 21
Vijayawada, 13, 15, 17, 30, 44
Visakhapat-nam, 17

W

wagtails, 45
Warangal, 2, 12, 16, 20, 30
warblers, 45
WATER FOWL COUNTS, 33
Watercock, 42
Weaver-birds, 53
West Godavari, 2
West Godavari district, 6
Western Reef Egret, 2, 3, 4
Whimbrel, 42
White Eye, 52
White Ibis, 41
White Spoonbill, 2, 3
White Stork, 41
White-backed Vulture, 51
White-bellied Drongo, 49, 51
Whitebreasted Kingfisher, 46
White-breasted Kingfisher, 49, 51
White-breasted Waterhen, 42
Whitebrowed Bulbul, 51
White-browed Bulbul, 49
Whitebrowed Fantail Flycatcher, 51

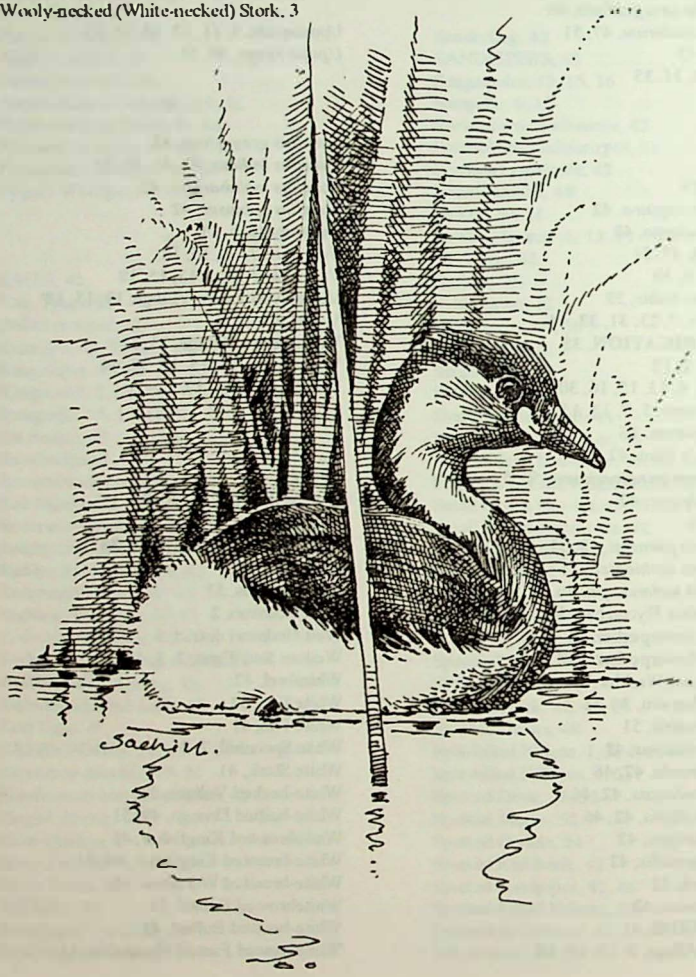
White-browed Fantail Flycatcher. 49
White-eyed Pochard. 42
Whitenecked Stork. 41
White-throated Munia. 52
Wigeon, 42. 46
Wood Snipe. 42
Woodcock. 42
Woolly-necked (White-necked) Stork. 2
Wooly-necked (White-necked) Stork. 3

Y

Yellow Wagtail. 47
Yellow-wattled Lapwing. 42

Z

Zosterops palpebrosa. 50. 52



INSTRUCTIONS TO CONTRIBUTORS

Contributors of scientific papers and miscellaneous notes are requested to assist the editors by observing the following instructions.

1. Papers that have at the same time been offered for publication to other journals or periodicals, or have already been published elsewhere, should not be submitted.
2. Papers/notes pertaining to the ornithology of India or to bird species found in India only will be accepted for publication.
3. Manuscripts should be typed double space, on one side of a sheet, and the sheets properly numbered. Two hard copies of the manuscript are required. If possible, the manuscript should also be submitted on a 3.5" diskette using MS Word or an MS Word file may be sent as an attachment by E-mail.
4. All common names of birds, mammals, *etc.*, should be followed by the scientific name the first time they are mentioned in the text. The scientific names should be underlined or in *Italics*. Lists of birds should be arranged in the Systematic Order given by Ripley, S.D. (1982): *A Synopsis of the Birds of India and Pakistan Together with those of Nepal, Bhutan, Bangladesh and Sri Lanka*. 2nd edition. Bombay. Bombay Natural History Society.
5. Trinomials referring to subspecies should only be used where identification has been authentically established by comparisons of specimens actually collected.
6. Photographs for reproduction must be clear and show good contrast. Prints must be postcard sized and on glossy glazed paper.
7. Text figures, line drawings and maps should be in India Ink.
8. Reference to literature should be placed at the end of the paper, alphabetically arranged under the author's name, with the abridged titles of journals or periodicals in Italics. Titles of papers should be in normal text and those of books in Italics, thus:

   Choudhury, B.C. (1984): Habitat survey project of BSAP—a preliminary report. *Mayura*. 5(4): 80-89.
   Ali, Sálim (1996): *The Book of Indian Birds*. Revised and enlarged 12th edition. Mumbai. Bombay Natural History Society / Oxford University Press.

9. Reference to literature in the text should be made by quoting the author's name and year of publication, thus: (Choudhury 1984).
10. The editors reserve the right, other things being equal, to publish a member's contribution earlier than a non-member's.

Editors: *Mayura*.

Our Logo: Indian Pitta *Pitta brachyura*

The word PITTA has come into Ornithology from the Telugu *pitta*, [small bird, (in the native tongue of the people of Andhra Pradesh state, India)], latinized by Vieillot in 1816, as the name of a Genus, and since adopted by English ornithologists as the general name for a group of birds, remarkable for their great beauty. In Ornithology, the word is first found as part of the native name *ponnunky pitta* given in 1713 by Petiver, in the "mantissa" to John Ray's SYNOPSIS, on the authority of one Edward Buckley of Fort St. George, Madras city. This bird is the *Pitta bengalensis* (now *P. brachyura*) of modern ornithologists.

[*Encyclopaedia Britannica*, 11th edition, 1911]